This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

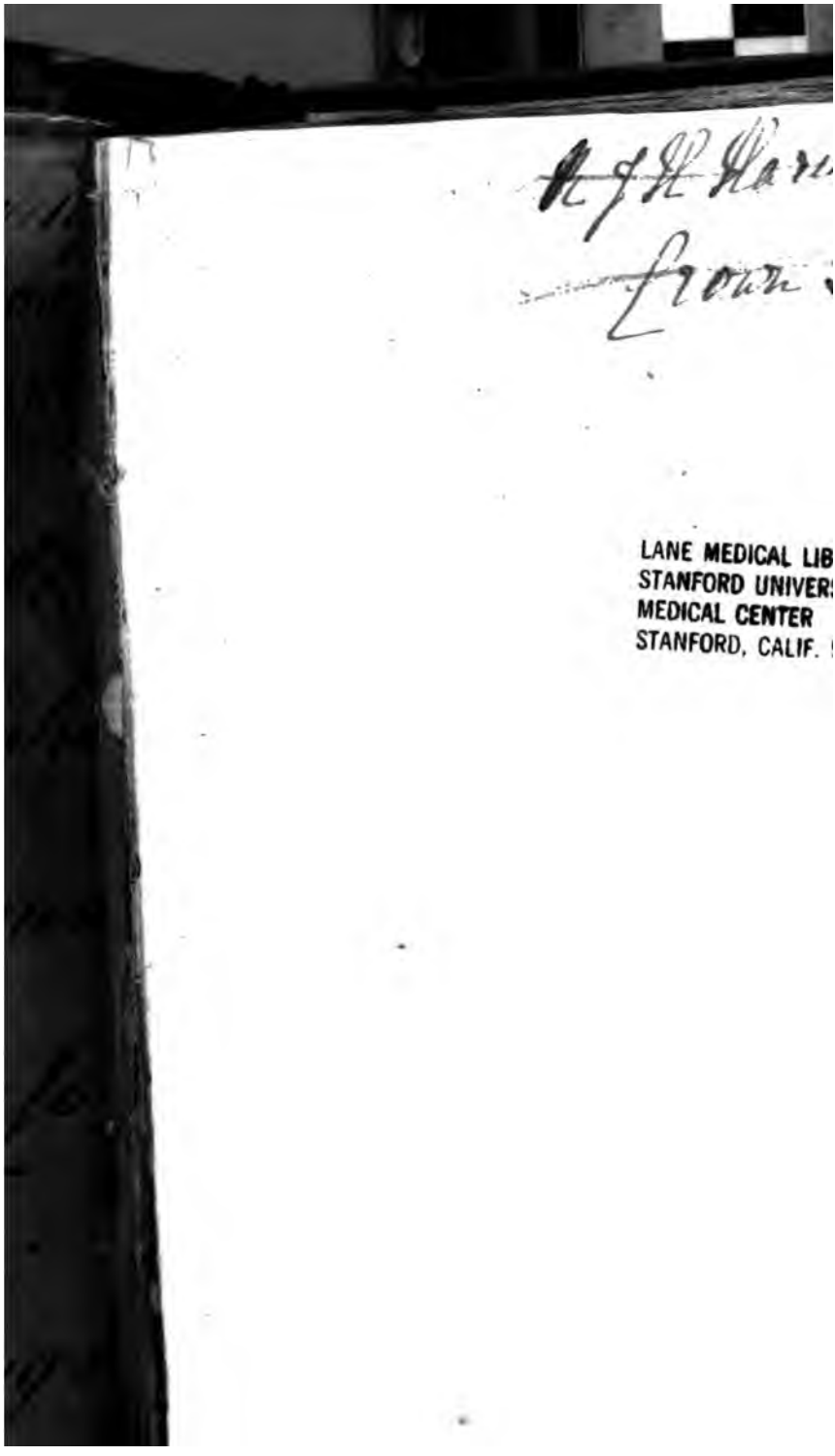
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

FEB 19

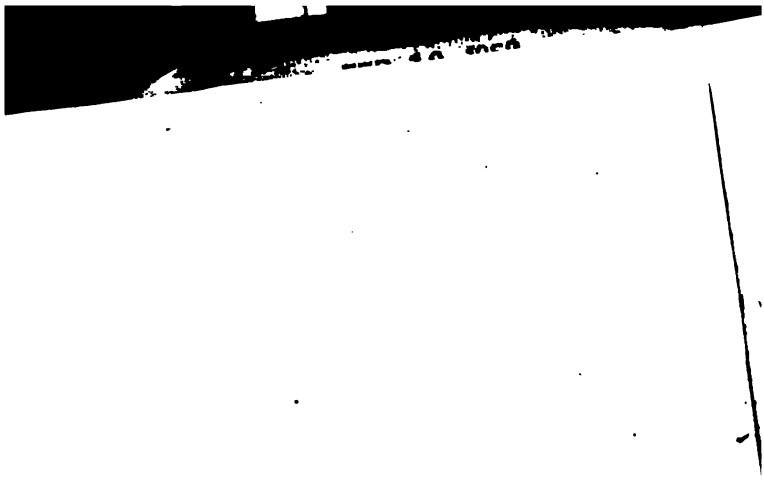
LANE
MEDICAL

LIBRARY

Gift
Boston Medical Library



LANE MEDICAL LIB
STANFORD UNIVERS
MEDICAL CENTER
STANFORD, CALIF.



MEDICAL CLIMATOLOGY.

FEB 10 1960

FEB 19 1959

21-A-4

MEDICAL CLIMATOLOGY:

OR,

A TOPOGRAPHICAL AND METEOROLOGICAL DESCRIPTION

OF THE

LOCALITIES RESORTED TO IN WINTER AND SUMMER BY INVALIDS OF VARIOUS CLASSES, BOTH AT HOME AND ABROAD.

BY

R. E. SCORESBY-JACKSON, M.D., F.R.S.E.,

FELLOW OF THE ROYAL COLLEGE OF SURGEONS,
LECTURER ON MATERIA MEDICA AND THERAPEUTICS AT SURGEONS' HALL,
PHYSICIAN TO THE NEW TOWN AND MEDICAL MISSIONARY DISPENSARIES, EDINBURGH.
AUTHOR OF "THE LIFE OF DR SCORESBY."

LONDON:
JOHN CHURCHILL, NEW BURLINGTON STREET.
MDCCCLXII.

FEB 19 1959

PRINTED BY NEILL AND COMPANY, EDINBURGH.

.793
342
862

TO

ALEXANDER KEITH JOHNSTON, ESQ.,

F.R.S.E., F.R.G.S., F.G.S.,

GEOGRAPHER AT EDINBURGH IN ORDINARY TO HER MAJESTY, AUTHOR OF "THE PHYSICAL ATLAS OF NATURAL PHENOMENA," "THE ROYAL ATLAS OF MODERN GEOGRAPHY," "THE DICTIONARY OF GEOGRAPHY," ETC., CORRESPONDING MEMBER OF THE EPIDEMIOLOGICAL SOCIETY OF LONDON.

AS A SLIGHT ACKNOWLEDGMENT

OF THE

ADVANTAGES DERIVED FROM HIS STUPENDOUS WORKS BY THE

MEMBERS OF THE MEDICAL PROFESSION,

THIS BOOK

IS (BY PERMISSION) RESPECTFULLY INSCRIBED BY

THE AUTHOR.

FEB 10 1952

PREFACE.

THE benign influence of change of climate upon certain varieties of disease is now so generally acknowledged by Medical Practitioners, and so thoroughly appreciated by those to whose sufferings it has administered relief, that to press upon the reader its manifold claims to his attention would be superfluous. The medical profession owes much to Sir James Clark for his invaluable services in rescuing this branch of Medical Philosophy from the state of unmerited neglect into which it had lapsed, and for raising it to the position which it now holds in the ranks of prophylactic and therapeutic medicine. The long period which has been allowed to pass since his valuable work entered the category of *rare* books is probably due to the increasing labours which ever attend the paths of those who are willing to further the interests of the profession to which they are attached. Had it been otherwise this book would not have appeared.

It is six years since the scheme of the present work was

first projected, not at that time with a view to publication, but to serve my own private use. Since then I have had additional opportunities for judging, from personal experience, of the sanative influence of the principal winter resorts in the south of Europe and in the north of Africa. Since then, too, I have spent three summers amongst the French, Swiss, and German spas. I have read every work upon climate, and cognate subjects, that I could procure; and I am more than ever deeply impressed with the importance of the inquiry which is at this moment being carried on in every quarter of the globe relative to the effects of migration from one portion of the earth's surface to another upon every variety of organised creatures. Since the body of this work passed through the press I have read with pleasure a too brief newspaper report of a paper on the subject of acclimatisation, communicated to the Geographical and Ethnological Section of the British Association, at its late meeting in Manchester, by James Hunt, Esq., Ph.D., F.S.A., &c. The paper is to be printed in the *Transactions*, and will doubtless be most interesting.

Medical Climatology is every day taking a stronger hold upon the minds, not only of medical men, but of the general public. Side by side with sanitary science it is developing into a subject of the utmost importance. Preventive Medicine is at length taking up a position commensurate with its value, and it is fostered by the remarkable facilities

which now attend the traveller in his wanderings over every part of the world. People look forward to the season when they "go away" to have their mental and physical condition re-invigorated, after nine or ten months of constant toil. Invalids, too—real invalids—travel much more than in former times, when the wealthy alone could enjoy the privilege.

An important question arises out of this widely developed system of migration. "Where must I go to?" is a form of interrogation which every medical practitioner should be prepared to answer without hesitation. It is a momentous question, however, and demands a careful and accurate reply.

In order to become acquainted with the predominating features of particular climates, medical men must either study every work on the subject as it appears, which I venture to believe few have time to do, or they must be supplied with a work containing the requisite information in a condensed and readily consultable form.

Such a book, I trust, the reader will find the one now presented to him. It is written in a spirit of impartiality, and with one only end in view, that of furthering the convenience and interests of my professional brethren. I have no particular climate to eulogise above its fellows, no personal interests to serve. I have written it, as I have said, for the accommodation of professional men, and I

do not intend it, except, perhaps, in rare instances, to be used as a *guide* by the invalid; he will, if he rightly understand his own welfare, be subject only to his own medical adviser. This principle I have endeavoured to inculcate upon non-professional readers at every opportunity throughout the work; and it has been simply with a view of avoiding circumlocution, that I have seemed in many instances to address my remarks immediately to the invalid himself.

In the preliminary parts of the work I have not attempted to exhaust the subjects treated of, but simply to supply enough of information to recall to the mind of the reader the general principles involved in the study of climatology. In the chapter upon diseases, in the alleviation of which change of climate may be usefully employed, it will be at once perceived that little more than an enumeration of them has been designed. My reasons for adding a chapter upon Mineral Waters, as well as those for describing the qualifications of Summer Resorts, will be found in the body of the work.

In the topographical and meteorological descriptions of the numerous countries and localities subsequently treated of, I have endeavoured to give a concise and impartial account of each place, as deducible from the works of many authors from amongst whom I have, as far as possible, selected the most trustworthy. Where I have been able to obtain personal knowledge of a climate, I have be-

so only after careful deliberation and comparison with the opinions of others.

In making use of the works of Climatologists I have desired as much as possible to acknowledge my obligations to the various authors, and have done so in full wherever it was practicable. But in a work of this kind it would have added but little to its utility, though much to its size, to have encumbered it with frequent foot-notes. And here I beg to offer my acknowledgments to all from whom, in a long course of reading, I have derived information.

The Map which accompanies the Book has been kindly adapted to it by Mr Keith Johnston.

18 Queen Street, Edinburgh,
November 1861.

MEDICAL CLIMATOLOGY.

CHAPTER I.

A SKETCH OF THE CAUSES OF PHYSICAL CLIMATE.

CLIMATE (κλιμα, κλινειν, to incline). *Mathematical Definition.*—If the earth, in its relations with the solar system, had been placed in such a position that the axis of its daily rotation had been perpendicular to the plane of its orbit of annual circulation, climate would have been a subject very readily disposed of. The globe, however, makes its annual journey round the sun at an *inclination* of 23° 30′ to the plane of its orbit, and by this marvellous arrangement brings regions which would never otherwise have known the sun, within the scope of his gladdening rays, gives to us the cheerful succession of the seasons, and causes that inequality which we experience in the length of the day and night. From a knowledge of the latter circumstance, the ancients were enabled to divide the surface of the globe into a series of imaginary circular bands or zones, parallel to, and proceeding from, the Equator in a direction towards the Arctic Circle. Each of these corresponded in breadth, in the lower latitudes, to the progressive increase of half an hour, and

in the higher latitudes of a quarter of an hour, in the length of midsummer-day, and received the name of *a climate.*

Modern Definition.—But in the present day the word climate has a very different, and, at the same time, a much more complex signification; so much so, indeed, that to explain in a few words all that is comprehended by the term is not an easy task. I venture to define it, however, as *the sum of all those physical forces which by their operation upon the constitutions of organised beings prohibit their permanent migration from one region of the earth's surface to another.* But *man*, it may be said, in objection to such an interpretation of the word—man, at all events, is cosmopolite; he can go everywhere and live anywhere! It is true that the erect and intellectual being who received at the hands of his Maker dominion over all precreated subjects, and to whose necessities all meaner creatures subserve, is endowed with a constitution of such a character as enables him to violate the laws of climate with apparent impunity, and to journey hither and thither in his military, commercial, or scientific capacity, according to the impulse of his will. We know that the inhabitants of temperate climates have passed prolonged seasons in foreign countries whose annual mean temperature is widely different from that of their native land. What better proof can be adduced of the perfect possibility of doing so than the facts that our own brave soldiers have fought and conquered beneath a broiling Indian sun, whilst our gallant sailors have borne unscathed the rigour of an Arctic winter. Nevertheless, the grand fundamental law remains untouched. The Great First Cause has distributed His creatures according to the counsel of His will; He has supplied them severally with constitutions, food, raiment, and even medicines suitable to the regions in which they are placed; and the order of His original design is yet main-

tained by "fire and hail, snow and vapours; stormy wind fulfilling His word." Man may make temporary exceptions; but nature knows no inconsistencies. Lions are not found on icebergs, nor do reindeer graze in the region of palms. Esquimaux would perish where negroes revel in the exuberance of nature's gifts. Palms, bananas, and tree-ferns, would be immediately disorganised if placed by the side of the chubby little moss that braves a climate of eternal snows. Nor can the inhabitant of temperate regions, with all his superior advantages, ultimately abrogate the laws of climate. We have no proof of, but, on the other hand, much to disprove, the possibility of even his *permanent* migration from one region to another. History has declared beyond dispute, that the races of different nations cannot by intermarriage propagate a distinct species through many generations; and, if it be not yet a demonstrable fact, it is, at least, a high probability, that *all* who leave their native soil to reside in foreign climates would ultimately *die out* were this not prevented by the return of their offspring to spend a portion of their lives in the mother country, or through the transfusion of new blood into the veins of their descendants by intermarriage with immigrants fresh from the parent stock. It is not our purpose to argue this point. The question we are to deal with is one touching a *temporary* and not a *permanent* residence in a foreign land. We are to regard climate in its aspect of remedial agent,—as the handmaid of medicine. We are to ascertain to what extent it may be employed to the advantage of one whose precarious health demands a residence in a country where meteorological vicissitudes are either at a minimum, or, at all events, are likely to exercise an influence upon his constitution different from that of his usual habitation. In the meantime, it is worth considering, briefly, what the circumstances

are which, individually or collectively, determine the climate of a country.

Causes of Physical Climate.—It will be sufficient to remark concerning our planet, as a whole, that it is spherical in form, having a superficial area of one hundred and forty-eight millions and a half square miles, one-fourth only of which constitutes the dry land, the remaining three-fourths being occupied by water; that it is completely surrounded by a ponderous and mobile fluid known as the atmosphere; and that it is intimately related with, although at a distance of ninety-five millions of miles from, the great luminous centre of the solar system. And we shall find, that the diversity of climate which exists in different regions of the globe depends simply upon the variety of relationship subsisting between these coefficients.

Distance from the Equator.—Since we are almost entirely dependent upon the solar influence for the temperature of the surrounding atmosphere, it will be obvious that the direction assumed by the sun's rays, in their approach towards the earth, will exercise a material influence upon the climate of a country. These rays fall perpendicularly only within the tropics, and upon different parts of this limited area, according to the season of the year; but beyond the parallel of 23½°, they descend, at all times, more or less obliquely. Now, it should be remembered that much of the calorific force of a solar beam is absorbed by the atmosphere during its transit through it to the earth, so that an oblique ray, having a greater distance to travel through that medium than one falling directly upon the globe, is proportionally reduced in temperature at the end of its journey. Moreover, a direct ray passes to the earth in a more concentrated form, and *strikes* the surface with intense heat, whereas an oblique ray *glances over* the surface of the globe,

affording a temperature proportionate only to the angle of its incidence. This is remarkably exemplified in the case of mountains having an equatorial and a polar aspect; the former receives the sunbeam more directly than even the plain below, and acquires a greater increment of temperature from it, whilst the latter knows little or no sunshine. How different is the northern slope of the Alpine range from that of the south; the Italian aspect, redolent of nature's choicest perfumes, luxuriant in vines, rich in pasturage; the Swiss side ice-girt and barren. But although the mean annual temperature of a locality depends chiefly upon its distance from the Equator, it must not be supposed that all places in the same degree of latitude have like climates, even if placed at the same altitude. That such is not the case is seen at once by glancing at a chart of isothermal lines.

Elevation.—As we have zones or climates of latitude, so we have also regions or climates of altitude. If we travel from the equator to the pole we pass through the various gradations of the vegetable world, beginning with palms and ending with arctic moss, beyond which is an impassable barrier of ice. In like manner, if we ascend lofty mountains, even those whose basements are surrounded by tropical plants, we witness the same series of vegetable productions, ending in the same shreds of moss, and bounded by the same zone of perpetual congelation—we understand, therefore, that temperature is diminished by elevation; but we know also that the relation which these forces bear to each other is not a fixed quantity. Thus, it requires an elevation of 330 feet in the torrid zone to effect a decrement of temperature equal to 1° of Fahr.'s scale, whereas, in the north temperate zone, an altitude of 250 feet exerts the same influence. In all climates, though not in equal

measures, the regions of temperature become progressively narrower as we ascend; so that, whilst the thermometer is but slightly affected during the first part of the ascent of a mountain, it afterwards records a marked diminution of temperature for very small increments of elevation. The cause of this reduction of temperature by elevation is due simply to the rarified condition of the ascending currents of air which exhibit a greater capacity for heat. Local circumstances exercise considerable influence in determining the altitude at which the snow-line, or line of perpetual congelation, occurs. Generally speaking, however, this point of elevation diminishes with an increase of latitude; that is to say, being highest within the tropics, it gradually descends until it reaches the sea-level, somewhere within the polar regions.

Countries moderately elevated are always more healthy than those at the level of the sea; their inhabitants enjoy an atmosphere more invigorating (because less contaminated with noxious effluvia than that of close valleys or other low lying situations) and are perceptibly stronger, more active, energetic and enterprising, than lowlanders. In hot climates there are usually residences erected for summer use, and for invalids at all seasons, in lofty situations. The Sanitarium of Darjeeling, in the Presidency of Bengal, is an example of a cool and salubrious retreat for British soldiers; it is 7500 feet above the level of the sea, and has a mean annual temperature of 50° Fahr. Yellow fever, the scourge of the Gulf of Mexico, is never absent from Vera Cruz on the sea-board, whilst at Xalapa, in the same parallel, but at an elevation of 4330 feet, it is unknown. The low-lying *tierra caliente* of Mexico is the hotbed of intermittent fever; but the city of Mexico itself, in the same latitude, and at an elevation of 7450 feet, is almost entirely free from it. Cholera, however,

has attained great heights; but even from this disease elevated places enjoy a certain exemption.

Relative position of sea and land.—The laborious investigations of scientific navigators have determined in respect of the temperature of the sea at great depths, that it is nearly uniform all over the globe, and that it varies very little from a mean of 40° of Fahr.; nevertheless, the *surface* temperature displays great diversity, ranging between 80°, near the equator, and 27° Fahr. in polar regions. The ocean, however, does not contract heat so readily as land, nor does it part with it so rapidly by radiation; it is less capable of sudden transitions, and it imparts to neighbouring countries a steadiness of climate unknown in the interior of continents. Hence we have *insular* and *continental* climates, with their modifications of peninsular, littoral, and so forth. In short, wherever we find land invaded by the waters of an ocean, or of a Mediterranean Sea, giving rise to islands, peninsulas, or other littoral sinuosities of greater or less extent, there we shall have certain indications, in the vegetation of the neighbourhood and other circumstances, of a climate considerably more temperate than that of any tract of inland country situated in the same degree of latitude. Maritime climates are free from excessive changes of temperature; their seasons are not marked by sudden vicissitudes, but are, on the contrary, slow and uncertain in their succession; and their atmosphere is never free from moisture. Continental climates, on the other hand, are usually very precise in their seasonal changes; their annual range of temperature is very extensive, and their seasons of rain and drought are very marked. Such places as Irkutsk, Tobolsk, and Barnaul, in the interior of Asia, are examples of excessive continental climates; whilst Ireland, the Channel Islands, and the south-coast of Devon-

shire, are familiar illustrations of localities relieved from intense meteorological phenomena by the presence of the sea.

The geographical relation of land and water is an important item in climatology. The western shores of Europe, for instance, are greatly indebted to oceanic influences for the mildness of their seasons; whilst the eastern shores of America, between the same parallels, although laved by the same waters, derive comparatively small advantage from them. A country situated in the meridian of an ocean occupied by vast tracts of ice, with a prevalence of transglacial winds, will endure severe winters. Algeria, in contradistinction to this, would have enjoyed a more genial climate if there had been a large body of water rather than a parching desert to the south of it. India has this advantage.

Oceanic currents, too, modify the climate of neighbouring countries; their influence upon the waters through which they take their course depending upon the temperature of the region whence they derive their origin. We may instance the familiar example of the *Gulf-stream*, of which it has been said, that the amount of heat diffused by it through the Atlantic Ocean, on a winter day, would be capable of raising the temperature of the atmosphere overlying France and Great Britain from the freezing point to the warmth of summer. Much of the difference which exists between the mean temperature of our own winter and that of the opposite shores of the Atlantic is attributable to the genial influence of this current. On the other hand, the *Arctic current*, which has its origin in regions of ice, skirts the dreary shores of Labrador, and passes on its way to moderate the excessive heat on the shores of central America. In like manner, extensive lakes, marshes, and rivers exercise a local influence.

Local Accidents.—Under this term we may conveniently

group together a large class of coefficients in the determination of climate, which, although distinctly manifesting the same original design as the circumstances we have already been considering, nevertheless have not a general but simply a local signification.

The aspect or exposure of a locality forms an important object for consideration in the study of climate. It does not necessarily follow the general inclination of the whole country, but the *aggregate* of local exposures is a safe guide to the general aspect. From what has already been mentioned concerning the direction assumed by the solar rays in their passage to the earth, it will be obvious that in our hemisphere a northern aspect must be subject to less extensive ranges of temperature than any other. The sun, at its greatest altitude, can do little more than pass its beams in a horizontal direction over the surface of such a country; and if the declivity be great, the locality must be doomed to perpetual shade. Hence, the difference of temperature between a clear and cloudy atmosphere will be less appreciable, nor can the transition from the heat of day to the cold of night be so remarkable. Such places, however, have, usually, an atmosphere clear, dry, and tonic; a temperate summer and a severe winter. A southern aspect is the reverse of this. Here the sun sheds forth his resplendent beams with unmitigated force, and bathes all nature in a flood of glowing light. With such a declivity there is a greater daily range of temperature; the atmosphere is frequently obscured by mists or overcast with clouds, and sunset is invariably followed by a rapid fall of the thermometer. Hippocrates, in his treatise, *περὶ ἀέρων ὑδάτων καὶ τόπων*, compares a northern aspect with the season of winter; a southern exposure with that of summer, and eastern and western declivities respectively with spring and autumn.

In general terms the institution of such a comparison may be sufficiently accurate; but it must be remembered that *exposure* is only one of many co-ordinate forces which unite in determining the climate of a locality. Eastern aspects, *cæteris paribus*, can never be so warm as corresponding exposures towards the west; because the power of the *morning* sun in warming the ground is counteracted by the cold effects of the preceding night, whereas the *afternoon* sun falls upon ground which has been gradually rising in temperature during the former part of the day. As a rule, those places are warmest which have a *south-south-west* or *south-west* exposure, whilst the coldest of all aspects is that towards the *north-east*.

It is an important matter, also, to be acquainted with the physical and chemical properties of *the soil of a country*, and to have a knowledge of its general geological conformation, as well as of its mineralogical productions. The temperature of a locality depends greatly upon the capacity of its soil for heat. Some kinds of soil are much more readily heated than others. Lands which permit of a rapid percolation of water are more healthy than others which emit all their water by evaporation, giving rise, at the same time, to a diffusion of gases through the atmosphere which render it unwholesome. Clay lands retain water and are cold; hence the necessity for thorough draining in such soils, by which means the climate is changed and improved. Chalky soils are also cold, but usually dry. Sandy or gravelly grounds are accompanied by dryness and warmth, and the more barren they are the fewer vapours they emit; they are, indeed, the counterpart of marshy soils. The colour of the land is likewise noteworthy; dark soils, for instance, absorb and radiate heat powerfully, whilst light-coloured lands reflect the solar heat. These, and many other circumstances

connected with the soil of a country, should be particularly observed in relation with its climate.

The state of cultivation to which a country has arrived has a direct bearing on the subject of climate. Marshy lands, and those overflowed by rivers, are always deleterious; and they who first attempt by axe and plough to reduce new countries to a condition of cultivation invariably suffer. *Trees* interupt the rays of the sun and deprive the ground of their influence. They give rise to extensive evaporation and radiation; but whilst their removal causes a higher mean temperature, it is followed by greater extremes of heat and cold. In some climates trees are essential, where they afford protection from the intense heat, and by evaporation provide the necessary amount of moisture in the atmosphere: it is not, therefore, always a safe proceeding to sweep away too much wood. A few trees near a dwelling give it a cheerful appearance, and are by no means hurtful; they do not, as has been generally supposed, affect the constitution of the gaseous elements of the atmosphere; but when too densely planted, they render it chill and damp, besides obstructing the salutary currents of air. All large bodies of water, as *lakes*, *rivers*, or *marshes*, act upon the atmosphere in a manner varying according to their superficial extent and depth. By evaporation they induce cold, but if they have depth enough to combat the influence of the sun's rays, they have the effect of preventing any great vicissitudes of temperature. In latitudes where the thermometer falls considerably below the freezing point, marshes and shallow lakes are frequently converted into true glaciers, which, in many instances, do not disappear until the subsequent summer, reducing considerably the mean temperature of the spring months.

A moderately undulating country is preferable to one either altogether mountainous or altogether flat. Mountains act on the climate of a country chiefly by determining the prevailing winds; they may oppose the passage of salubrious as well as noxious winds, and, of course, exercise a corresponding influence. If the chain be lofty and snow-capped, the surrounding country is often troubled with cold, piercing blasts; moreover, by condensing the aqueous vapour of the atmosphere, mountains often procure for the plains beneath a superabundance of rain. Close valleys are subject to all the inconveniences of a sluggish atmosphere, and their occupants suffer accordingly. Open valleys, on the contrary, which permit a free course to the winds, and, especially, if possessed of a declivity sufficient for carrying off their waters briskly, are healthy enough. It is in valleys of the former class—where the atmosphere is so pent up that it cannot circulate, and whose waters stagnate and evaporate, filling the air with noisome fogs—that we meet with that unhappy and degraded abortion of humanity, the cretin. And, lastly, the different aspects of the sky are not without their due influence upon the climate of a country. Clouds intercept a great deal both of the light and heat of a sunbeam; so that, all other things being equal, that country has the higher mean annual temperature which has the fewer clouds.

The Atmosphere is that ponderous, yet exceedingly mobile fluid which surrounds our planet at every point, pressing with an equal force over the entire extent of its surface, and upon the plants and animals which inhabit it. It is supposed to extend to a height of forty-five miles from the surface of the earth; but we are interested only in that portion which lies nearest to us, which is densest by reason of the superimposed masses pressing upon it, and wherein

those meteorological phenomena, to which we are now for a few moments to turn our attention, occur.

For practical purposes, it is sufficient to know that the atmosphere consists of two elementary gases, Oxygen and Nitrogen, in the proportions of one volume of the former to four of the latter, of a minute quantity of carbonic acid gas, and of a variable amount of aqueous vapour. Together with these we meet with a trace of ammonia, a gaseous ingredient known by the name of Ozone, and a varying quantity of other substances to which the atmosphere simply acts the part of a vehicle, and which are neither essential nor constant to it. The components of the atmosphere do not exist in a state of chemical union, but merely in the form of a mechanical mixture; and these, having different specific gravities, it might easily be supposed, would have separated had such a state of matters not been prevented by what is termed *the diffusive power of gases*, a property which is believed to depend upon the circumstance of particles of a like gas being repellant of each other, whilst those of different kinds permit of a close approximation. It is unnecessary to discuss the theoretic composition of the atmosphere, and the means which have been employed by scientific observers to determine the constancy of certain, and the variability of others, of its constituent parts. What we understand by a pure air, practically considered, is one containing a sufficiency of vital elements, having, at the same time, a due capacity for those effete matters which it is the object of the lungs to throw into it during the act of respiration. Of the various gases exhaled from the surface of the globe, and by which the atmosphere is deteriorated, we need not here treat. The commonest laws of Sanitary science inculcate the necessity of preventing such emanations, so far as man can effect an

end so salutary, whilst other sources of impurity, which by reason of their extent are beyond his control, will be adverted to when describing the localities in which they occur.

Electricity and Ozone.—It would be inconsistent with the cursory nature of these remarks to attempt an elucidation of the various hypotheses which exist relative to the influence of atmospheric electricity upon the physical well-being of mankind. The correlations of electricity and biology are still, indeed, so much the subject of controversy, that it would scarcely be possible, within our limits, even so much as to mention the elaborate researches which have been made with a view of determining their reciprocal actions; nor would data so contradictory in themselves be likely to lead us to a satisfactory deduction. That the subtile fluid which permeates the atmosphere around us at all times, and with ever varying intensity, does influence not only our physical but also our mental condition, cannot be doubted; but the manner of its action has not hitherto been clearly defined. It has been observed that during the visitations of epidemics, certain electric phenomena, such as *silent lightnings*, and even violent thunderstorms, have prevailed; and, moreover, that the progress of the disease and that of the electrical discharges has usually been along the margin of rivers. It was noticed that previous to the epidemic of cholera in 1854, the atmosphere for a considerable period manifested no symptoms of electric disturbance at all, but that during the prevalence of the epidemic *positive* electricity was powerfully indicated.

Closely allied with electricity, and probably arising from it, we have another occult atmospheric ingredient whose mysterious nature has been made the subject of comparatively recent inquiry. *Ozone* was the discovery of Professor Schönbein of Basle, who, about the year 1840, noticed that

in the decomposition of water by means of a voltaic pile whose electrodes consisted either of platinum or gold, the oxygen discharged at the positive pole emitted a peculiar odour, but that when the apparatus consisted only of oxidisable metals, the oxygen presented no peculiarity. This allotropic form of oxygen was subsequently procured by other chemical agencies, and moreover it was found to exist in a free state in the atmosphere, especially after thunderstorms, and also in the neighbourhood, and during the operations of large electric machines. Ozone is a gas possessed of remarkable powers of oxidation, and, on that account, is supposed to be capable of strong disinfecting and antiseptic functions, whereby it relieves the atmosphere of noxious miasmata and other impurities; it is incapable of supporting animal life, and, when breathed, irritates the lining membrane of the air-passages. A rabbit, placed by Schönbein in an atmosphere artificially impregnated with a small percentage of ozone, died in a few hours; and the presence of $\frac{1}{1000}$ of the same gas in air inhaled by mice was almost immediately fatal. Much has been expected from this new atmospheric element. It has been stated that in it lies the secret antagonism to epidemics; because there is evidence to prove that during calm weather this class of diseases increase in virulence, whilst ozone, under the same atmospheric condition, diminishes in amount; and that when winds arise the pestilence retreats, whilst, and perhaps because, ozone increases in quantity. According to other authorities, when the amount of ozone in the atmosphere is not exaggerated, it acts merely as a slight stimulant; but that when present in excess, it gives an impetus to pulmonary and bronchial affections, and is capable of itself of giving rise to an epidemic of influenza. But our knowledge of the properties and functions of ozone is based upon far too

slender data as yet to enable us distinctly to aver its specific action upon the welfare of mankind. Even the means which we at present possess for ascertaining its presence in the atmosphere, and for accurately determining its quantity under a variety of circumstances, are still insufficient and far from satisfactory. Schönbein's test-papers are not by any means safe guides in this respect; for we know that not only do these papers manifest different degrees of blueness according as they are situated in exposed or protected situations, but that they are liable to a similar discoloration by means of certain atmospheric impurities of animal as well as vegetable origin. A very able paper on this subject was communicated by Dr Arthur Mitchell to the "Edinburgh New Philosophical Journal" for July 1860, in which he declares himself to be dissatisfied with a series of observations made in Algiers in the year 1855, simply because he could place no confidence in the reagent. I have much confidence in referring to Dr Mitchell's paper, because, although unacquainted with him personally, I know him to be a careful and laborious meteorologist; and still more so, because in 1857, without being acquainted with the results of his researches at all, I made an elaborate series of experiments at the same place (Algiers), and with pretty much the same want of success. There are other methods employed besides that of Schönbein, and of these Moffat's is decidedly the best; but I believe they are all more or less defective, and until we arrive at accurate means of determining its presence in the atmosphere, the real effects of ozone on the animal economy must remain a matter of considerable doubt.

Insolation.—The word light has been employed by all ages in a metaphorical sense, to signify whatever is commendable, pure, and enjoyable; and in its actual meaning, it is not

only desirable but essential. Everybody has witnessed more or less the evil effects arising from a deprivation of light; etiolation, or blanching, is the result both in animals and vegetables. A stunted growth is the peculiar effect of darkness; and, *cæteris paribus*, that country will have the best developed race of men, and the finest vegetable productions, which has the most light. The intensity of solar light is intimately connected with the subject of climate; it may be correctly ascertained by means of such instruments as the *actinometer* or *photometer*; and it should always be regarded as an element of no mean importance, both in the choice of a locality and also in the selection of an apartment. Invalids not unfrequently forget that the beneficial effects derivable from change of climate are to be found only in the sum of little things, and not in the specific action of a new atmosphere.

Hydro-Meteors.—The prevailing amount of moisture contained in the atmosphere, and the relative frequency of rainy days of a locality, are characteristics of its climate of the utmost importance. Extremes of dryness and humidity are alike injurious, and produce effects corresponding with the natural temperament of the individual. Thus, a dry air, being powerfully tonic and stimulating, is agreeable to persons of relaxed habit of body and leucophlegmatic temperament, because, having a large capacity for moisture, it tends to carry off from their bodies those stagnant and depressing humours which clog the organic functions. But, on the other hand, they who are nervous and irritable, and of sanguinolent constitution, cannot bear the excitation caused by a dry air; they require a certain amount of moisture to allay the excess of tonicity already existing. A moderately dry atmosphere, however, is best adapted to the physical condition of mankind generally; not only on

account of its direct effect upon his body, but also because it is that state which least of all encourages the diffusion of poisonous gases. A humid atmosphere is generally deleterious; if accompanied by heat, it wearies and debilitates the frame; being already surcharged with moisture, it refuses to receive the aqueous exhalations which the lungs and the skin are both desirous of imparting to it, and a sense of oppression and heaviness is the result. When accompanied by cold, the above discomforts are increased by a feeling of chilliness and an absolute tendency to many forms of disease. With the atmosphere in such a condition as this, the organic powers are enfeebled, they are incapable of performing the necessary chemical and mechanical functions required of them, and in consequence of this certain poisons are generated within the system, which, in their turn, vitiate the blood and ultimately manifest their presence by local determinations, such as we observe in scrofula, rheumatism, pulmonary consumption, and the like. The causes of atmospheric moisture exist chiefly in the condition of the soil, as already mentioned, in the state of the cultivation of a country, and its proximity to the sea or other extensive bodies of water, and in the prevalence of certain winds, of which we shall have to speak hereafter.

Rain.—The precipitation of moisture in the form of rain varies in amount and frequency in different regions of the globe; in a few the phenomenon is entirely unknown, whilst in some others it occurs every day. Places near the sea have usually an atmosphere well charged with aqueous vapour, for which, other things being equal, warm air has a greater capacity than cold. This kind of maritime moisture is, however, less deleterious than that arising from large bodies of water inland, and a person who could by no means bear the latter might suffer the former with some degree of

impunity. Perhaps the salts which are held in solution by vapours arising from the sea may have something to do with this. Rain falls in the largest quantity in regions where evaporation is most extensive. It bears a direct ratio to the temperature of the country; so that at the equator, where there is the greatest amount of heat, there is likewise the heaviest fall of rain; but whilst the annual amount of rain decreases towards the poles, *the number of rainy days* increases. Mountainous countries are more frequently visited with rain than those of a flat or slightly undulating character; in England this is observable to double the amount. Mountains of rugged aspect increase the precipitation of rain more than such as have smooth sides, and this again increases with elevation; but lofty table-lands, on the contrary, have generally very dry climates. Almost all places have their rainy seasons, and it is essential to know at what time they occur. At St Petersburg, for instance, where the mean annual amount is only seventeen inches, it occupies about 170 days in its fall, whilst at the equator 80 days suffice for the precipitation of its yearly amount of 95 inches. In Ireland and on the western coast of Great Britain, the fall of rain is fully twice as much as in other parts of the kingdom, and the most copious precipitation takes place in the hot season, and the least in the months of February and March. At Sierra Leone, the rainy season extends from June to September, and is followed by the "Smokes," a dense fog which covers the land for several days at a time; the mean annual fall is 189 inches. In Upper Egypt, on the other hand, rain is unknown; and it never falls on the Pacific slope of Peru.

As I have previously noticed a connection between moisture and malaria, it may be as well to dismiss the

latter subject with a few general remarks. Whatever may be that substance which has hitherto eluded all our endeavours at manipulation, and with whose form and character we are practically unacquainted, it is certain that there are many localities on the surface of the globe which have the power of rendering the atmosphere poisonous and unfit for respiration. Impurities proceeding from a want of cleanliness have the same influence; but we are here speaking of large tracts of land known by the name of *marshes*, or some synonymous term. The substance which poisons the atmosphere we are accustomed to call an *effluvium*, or a *miasm*, and the air so poisoned we term *mal-aria*. A certain amount of heat and a certain amount of moisture are both requisite for the development of miasmata; too much or too little of either prevents their emanation. Up to a certain point increase of temperature enhances their virulence, but if the land whence they emanate be *dried* by the sun's influence, they at once cease. An atmosphere surcharged with moisture does not readily transmit them, nor does a perfectly dry air retain them, for persons who are compelled to reside in marshy districts can preserve themselves free from their effects in a close apartment with good fires. The atmosphere containing these obnoxious particles is always dense and heavy; it seldom rises many feet above the ground, and is checked in its course by certain kinds of barriers. Sometimes the lower part of a house is surrounded with malaria, whilst the upper part is quite free from it; a clump of trees, when the air is calm, acts as an effectual barrier, probably because the impurity has an affinity for trees, and is unwilling to pass away from them. Water appears to absorb miasmata; so that a vessel lying a little way from the shore, even with the wind off the land, is quite safe from them. Marshes are always more

dangerous during the night than during the day; that is to say, such as have the power of poisoning the air which floats over them: all marshes have not this effect; peat-bogs, for instance, are generally perfectly innocuous. Whatever tends to dry up the ground has the power of removing the evil influences of marshes; so that cultivation is one of the best means. People who reside in malarial districts are usually short-lived; they never get rid of the evil effects of the poison—first of all suffering from intermittent and remittent fevers, and subsequently from organic lesions, and a vitiated state of the blood; their development, physical as well as mental, is torpid and stunted, and their intellectual qualities are seldom very vigorous. For strangers, who casually find themselves in such localities, the principal rules to be observed are, to be properly clothed with stout apparel, and with flannel under garments; to live moderately, neither too abstemiously nor too luxuriously; and to avoid exposure to the night air, counteracting its damp, pernicious effects by good fires.

Dew is a form of aqueous deposition, whose injurious effects upon the constitution of delicate persons is too frequently neglected. Whenever the temperature of the atmosphere is diminished its capacity for aqueous vapour is lessened, and it sets free a certain amount of that fluid which it was previously capable of holding in solution. This state of matters occurs during the absence of the sun, the deposition of dew commencing usually within a short period of its departure; it increases in quantity (according to the condition of the atmosphere), until a short time after midnight, after which the deposition gradually diminishes, and it is eventually dispersed by the rising sun. In certain arid countries, as in some parts of the Sahara, dew is unknown, and it attains its maximum of deposition in the

neighbourhood of large sheets of water, as of lakes and marshes, and in maritime districts.

Prevalent Winds.—Winds are simply currents of air fulfilling, in their journeyings, certain physical laws which are ever in operation at the surface of the globe. They have their origin chiefly in vicissitudes of temperature and in the alternations which occur in the aqueous vapour of the atmosphere, phenomena whose causes we have hitherto been considering. But in selecting a residence for the advantage of change of climate, a knowledge of the *local peculiarities* of a place will go far to determine what must be its prevalent winds. The stupendous phenomena of the *trade winds* are examples of a *constant* atmospheric circulation in which a cold under current is constantly passing from the polar regions towards the equator, whilst a correlative upper current of warm air proceeds from the equatorial regions towards the poles. There is another class of winds to which the name *periodical* attaches, and of which the *Monsoons* are typical; and a third variety, known as *variable* winds, which will be treated of hereafter under the separate places where they prevail. Islands, peninsulas, and the shores of continents, are subject to *alternating* currents of air, called *land and sea breezes*, which have their origin in the following circumstances. When the sun rises it sheds its rays alike upon sea and land, but with unequal influence —the land is rapidly heated and the superincumbent air is quickly rarified, whereas the temperature of the sea is scarcely raised at all, and the air above it retains very nearly its usual density, excepting so much of it as blows softly towards the land (the *sea-breeze*) to supply the place of that which the heated earth has dispersed. Again, after the sun has disappeared below the horizon, the temperature of the atmosphere overlying the land rapidly falls below

that resting upon the ocean, which maintains a certain uniformity, and, consequently, the now denser air of the former passes off to mix with the warmer air of the latter, constituting the *land-breeze*. Those who have witnessed in their own persons the difference between the cold, bleak north-west wind which has earned for certain parts of Naples the epithet of "Siberia," and the sirocco as it occurs in the same locality; and who have felt the effects of the *Simoom*, the *Samiel*, the *Khamsin*, the *Harmattan*, or the *Solano*, will understand the necessity of having a knowledge of *prevailing winds*.

Temperature.—What has already been said concerning the various modifying causes of climate may be aptly applied to the subject of temperature; for, in truth, the terms are very nearly synonymous. We are indebted for the blessings of warmth, as well as of light, almost entirely to the influence of the sun's rays, the internal heat of the globe exercising scarcely any effect upon the temperature of the surface. Extremes of temperature, or even sudden transitions of not very extensive character, are amongst the most productive causes of disease; when, therefore, we are contemplating a change of climate for the alleviation of bodily infirmities, it will be one of our chief aims to select a locality wherein vicissitudes of temperature are at a minimum. And it is important to know not only the mean annual temperature of places, but also that of the seasons, months, and days; for the average yearly temperature of any two places may be exactly alike, whilst that of their seasons may differ widely. The difficulty of obtaining accurate meteorological data for certain places led to the discovery that a very fair representation of the mean annual temperature may be derived by passing travellers, from springs situated in shady places and known to issue from

considerable depths. It has been observed, that these (avoiding, of course, thermal springs, which are easily recognisable), at the moment of their leaving the ground, exhibit a temperature corresponding as nearly as possible with the mean yearly temperature of the neighbourhood. Humboldt discovered also that the mean daily temperature may be obtained with tolerable accuracy by observing the thermometer at the moment of sunset. It was this distinguished traveller who originated the scheme of isothermal lines, or lines traced upon the surface of a map in such a manner as to connect all places having corresponding mean annual temperatures; this, and many other physical laws, may be studied with advantage in any of the manuals of meteorology.

Having thus briefly alluded to the principal circumstances which enter into the constitution of climate generally, it remains for us, in a subsequent part of the work, to consider the varieties of climate which arise out of the manifold relations which these co-ordinate forces bear to each other in particular localities.

CHAPTER II.

HYGIENICS.

THE employment of change of climate as a remedial agent does not owe its origin to the present age. Its value, as such, has fluctuated according to the difficulties or facilities which have at various periods attended its application, but its efficacy was as much appreciated in the days of Hippocrates as in these.

Lucretius was not slow to observe the manner in which change of climate operated in those who wandered far from their native land. Leo Africanus treats of the curative influence of the atmosphere in the country of the negroes, and avers, "*ut siquis alibi morbosus eo advehatur, optime statim sanitati restituatur.*" Galen indoctrinates the efficacy of change of climate as a remedial agent, and professes to teach all who come to him not only concerning their diet and other necessary regimen, but "*insuper regiones, quas eligere, quas vitare.*" And so much faith had Eugubinus in change of climate that he gives to it the precedence of all medicines: "*alia utilia,*" he says, "*sed ex mutatione aëris potissimum curatus.*"

I need not lead evidence to prove the influence which climate exercises upon nations. We do not hesitate, in the present day, to attribute the characteristic features, mental

as well as physical, of the various tribes of the earth, in a great measure to the climates in which they dwell. Their laws, customs, manners, from the occupation which exercises their highest faculties down to their veriest frivolities, all are tinctured by the same insidious influence, all are fashioned in the same mould; and although throughout the world they are marked by the features of a common nature, yet each particular tribe is impressed with characters peculiar to itself, which it would eventually lose if transported to a different climate. Hear what Sir Humphrey Davy attributes to the climate of England:—"Of all the climates of Europe, England seems to me to be most fitted for activity of mind, and the least suited to repose. The alternations of a climate so various and rapid constantly awaken new sensations, and the changes of the sky from dryness to moisture, from the blue ethereal to cloudiness and fogs, seem to keep the nervous system in a constant state of excitement. In the changeful and tumultuous atmosphere of England to be tranquil is a labour, and employment is necessary to ward off the attacks of ennui. The English nation is pre-eminently active, and the natives of no other country follow their object with so much force, fire, and constancy."

The Constable of France, at Shakspeare's bidding, grows indignant at the thought of being overpowered by that "nook-shotten isle of Albion," whose climate he judged to be inferior to that of his own country. He asks, half fearful, half in anger—

> "Where have they this mettle?
> Is not their climate foggy, raw, and dull?
> On whom, as in despite, the sun looks pale,
> Killing their fruit with frowns? Can sodden water,
> A drench for sur-rein'd jades, their barley broth,
> Decoct their cold blood to such valiant heat?

> And shall our quick blood, spirited with wine,
> Seem frosty? O, for honour of our land,
> Let us not hang like roping icicles
> Upon our houses' thatch, whiles a more frosty people
> Sweat drops of gallant youth in our rich fields."

The same versatile genius displays his knowledge of the influence of climate upon health, by another passage, in which, in terms of more tender solicitude, he bids Leontes welcome Florizel with the following invocation :—

> "The blessed gods
> Purge all infection from our air, whilst you
> Do climate here!"

Nor is it necessary for me to quote a number of cases in order to prove the value of change of climate in certain forms of disease. Its efficacy has long been admitted; and in these days, in which ease and expedition have combined to deprive travelling of its terrors, we are not likely to neglect the use of a handmaid rendered by these advantages so much more available. Like that of all other methods of treating disease, the reputation of change of climate has suffered on account of its indiscriminate application. There are cases in which removal to a different climate is not unfrequently practised with positive injury to the invalid; and we know full well that there are some kinds of disease which, whilst in their early stages they admit of benefit from a change of climate, would at a later period be brought by the same mode of procedure to a speedily fatal issue. Take the most common example of this, in the case of a person suffering from pulmonary consumption. If change of climate be resorted to when the first symptoms show themselves, the remedy, if carefully applied, will in all probability work out a cure, not by its own specific action, but by means of collateral circumstances to be ex-

plained hereafter. But if change of climate be not made use of until every other remedy has been employed without advantage, and not until the disease is so far advanced that no reasonable person could expect to derive benefit from the change, then to send that patient away from home would be simply to inflict upon him an unpardonable cruelty. And it must always be remembered, that the consumptive patient is usually the last to give up hope, so long as there is another remedy to be tried; so that the medical practitioner may expect frequently to be made the recipient of unmerited reproach, when, in the unflinching exercise of his duty he withholds his sanction to the removal of a dying patient from his home.

But, despite the obloquy that has been earned by repeated malpractice for this really useful remedial agent, we have evidence enough in its favour wherewith to repudiate the undeserved censure, and to determine its fitting rank in the list of therapeutics. And in support of this let me here adduce a passage from the work of a modern authority, whose keen perception and discriminating judgment have tended not a little to unravel the mysterious agency of which we are treating. Sir James Clark writes emphatically on the subject. "My own experience," he says "has been amply sufficient to satisfy me that, for the prevention and cure of a large class of diseases, we possess in climate an efficient remedial agent; and one for which in many cases we have no adequate substitute." "But," he adds in another passage, "neither travelling nor climate, nor their combined influence, will produce much permanent benefit, unless aided by proper regimen, and directed with due regard to the constitution of the patient and the nature of his disease. And here I would comment upon the error of expecting too much from the mere change of climate. The

air or climate is often regarded by the patient as possessing some specific quality, by virtue of which it directly cures his disease. This erroneous view of the matter not unfrequently proves the bane of the invalid, by leading him, in the fulness of his confidence in climate, to neglect other circumstances as essential to his recovery as that on which his hopes are fixed."

It is to the consideration of these confederate circumstances that the present chapter is to be devoted; and surely no one who is able to procure for himself the benefits derivable from change of climate would capitulate with disease for the sake of sparing himself a little self-denial. "Health," says Paley, speaking of temporal necessities, "is the one thing needful. Therefore, no pains, expense, self-denial, or restraint, to which we subject ourselves for the sake of health, is too much. Whether it require us to relinquish lucrative situations, to abstain from favourite indulgences, to control intemperate passions, or undergo tedious regimens; whatever difficulties it lays us under, a man who pursues his happiness rationally and resolutely will be content to submit."

The doctrine of Hygienics, which constitutes the sum of preventive medicine, treats of those means which must ever be the subjects of our solicitude if we would preserve intact that measure of health with which we are endowed. But it commends itself likewise, and even more importunately, to those invalids who seek in change of climate a restorative from their prevailing malady. Before entering on the particulars of this part of my work, however, let me premise in a few sentences some general hints for the purpose of refreshing the memories of those who may be called upon to determine the best means of alleviating disease by change of climate.

When, after a careful deliberation upon the case of any particular patient, it is apparent that a change of climate is essential to its proper treatment and recovery, it next becomes a question as to what class of climate he should resort to, and having determined that, then to select the best locality over which such a climate dominates. The climate of any particular locality cannot always be exactly interpreted from a mere string of figures said to represent the usual vicissitudes of its meteorological phenomena. They are very valuable in conjunction with other knowledge, but they ought not to be relied upon exclusively; so that information from intelligent persons who have lived long in the place, as to the general character of the weather, and several other circumstances which are likely materially to affect the comfort of a stranger residing in it for a season, should always be obtained, where it is practicable, before sending a patient to visit it. It has been my object to gather as much of such knowledge as I could, in order to lay it before the reader, that he may judge for himself as to the suitableness of the different localities hereafter mentioned.

Climates, according to their various predominating features in a meteorological point of view, receive the names of torrid, temperate, frigid, hot, cold, dry, humid, and so forth, either simply or in combination, as cold and humid, hot and dry. They have other terms applied to them, however, denoting the peculiar influence which they exercise upon the constitutions of persons inhabiting them, whether permanently or for a season. These are exciting, irritant, bracing, sedative, relaxing, and such like. Now it becomes a question to which class of climate the patient should be sent; for it is but doing little for him to say, "You had better go away somewhere," unless such advice be followed by a recommendation to a fitting place. Is it a case of hypochondriasis,

or at least one in which depression of spirits is the dominating evil, do not send him to a soft, sedative climate, but to one of a cheerful aspect and rather invigorating atmosphere; or to such a case perhaps a variety might be better adapted. Is it a patient suffering from a chronic affection of the air-passages, in which the mucous membrane is much relaxed, and there is copious secretion, do not send him to a relaxing climate, because it will not impart the tone he requires. On the other hand, if the mucous membrane be dry and irritable, a sedative climate will most likely be indicated.

But we shall have to return to the subject of diseases hereafter, and need not dwell longer upon the necessity of making a careful selection of a climate suited to the necessities of the invalid. There are other circumstances of a preliminary character, however, which may be mentioned with propriety here. The invalid should be given clearly to understand the position in which he will be placed with respect to the agency which is to operate his cure. Or rather that the effect of change of climate will probably be little more than to place him in circumstances wherein he will enjoy facilitated opportunities for overcoming his besetting malady. It may be that the benefits he is desirous of obtaining will accrue to him through the change of scenery rather than the change of atmospheric phenomena. His mind is to be relieved of anxious thoughts by a crowd of novelties obtaining access by the sense of vision rather than by the air-passages. Or, it may be, and in nine cases out of ten it is so, that the object to be attained by a change of climate is simply permission to enjoy exercise in the open air during a season, when, if he had remained at home, he would either have been confined to the house, or would have incured irreparable injury by exposing himself to the external air.

The season of his departure and return should be advised upon. Perhaps it might be desirable to pass two winters in a mild climate; and if he be sent abroad, it would be necessary to determine whether he ought to return during the intervening summer, or whether it would be more convenient for him to spend it at one of the continental watering places. Perhaps a course of mineral waters preceding, or subsequent to, his sojourn in a foreign climate, would be advantageous, and if so, it should not be neglected. It will also be essential to prepare the invalid by a previous well-regulated diet and regimen for his journey by subduing all excitement and inflammatory tendency; for I need hardly add that these are both increased by travelling.

Preliminary instructions of such a kind, according to the nature of his disorder, should be given to every patient before he sets out on his journey. The previous preparation, the manner of travelling, the dangers to be avoided, and the objects to be attained, should form part of the physician's prescription in all such cases. And it behoves the valetudinarian, who has proceeded, under the careful direction of his medical adviser, to a locality in which he is to pass the winter, in the first place to exercise his discretion in the choice of a residence, and subsequently, to conform to the regimen which has been prescribed for him. With a view of aiding him in both these duties, I will now pass on to offer a few general remarks upon the subject of *hygiene.*

Choice of a residence.—A fair prospect and a pure atmosphere are the points of importance.—"*Qualis aër, talis spiritus; et cujusmodi spiritus, humores,*"—the former regales the mind, the latter refreshes the body. Plato recommends that no traveller should lodge in a city that is not governed by laws, and that has not a quick stream flowing

near it. The invalid will not, however, always meet with those sanitary regulations which are most conducive to health ; but he may, at all events, follow the spirit, if not the letter, of the sage's advice, by adopting a residence in such a locality as is least crowded and somewhat elevated, so as to avoid a vitiated atmosphere and the dampness arising from stagnant waters. There is one circumstance particularly to be remembered, namely, that in removing to what is understood to be a mild winter climate, at least in southern countries, the traveller will meet with houses that are built not so much with a view of being warm in winter as of being cool in summer ; and hence, especially in Italy, they are constructed in such a manner that the sun's rays can rarely, if ever, gain access to the interior of their apartments, which are usually lighted from an inner court. Such houses are cold and gloomy in winter, and should give place in the invalid's selection to a warmer and more cheerful edifice.

The most desirable aspect for an invalid's residence is that in which the warmth and light of the sun are enjoyed during the longest period on a winter day, and one which, at the same time, is protected from the influence of noxious winds. Dampness, the especial bane of all delicate constitutions, should be guarded against by choosing a somewhat elevated situation upon an inclined surface of sandy or gravelly construction ; and, with the same object in view, ponds, lakes, and marshes should be avoided. If, however, in spite of these precautions, there be the least suspicion of dampness in the walls of the house, the upper apartments alone should be occupied ; and in this manner both financial and sanitary economy may be combined with advantage, for the upper storeys of houses are not only usually the cheaper, but also the more healthy. In addition to

other requisites, it is essential that the house have near it a fitting place for out-door exercise. Unfortunately, however, it often happens that the invalid finds himself a martyr at the shrine of fashion; for in almost all places of winter resort the hotels and lodging-houses, which alone have suitable accommodation, are crowded together, and that, too, not unfrequently in an ill-chosen locality.

But there is something to be desired beyond the external circumstances of an invalid's dwelling. The view from the windows, as previously mentioned, should be cheerful and engaging; and, still more, the internal arrangements should savour of comfort. The rooms should be lofty and airy; there should be, if possible, a fire-place capable of consuming *coal;* for that is a more wholesome fuel than wood, and at night the apartments should be lighted with candles, for they are less deleterious than gas. Close stoves, hot air, or hot-water pipes, and every variety of *chauffage*, excepting that effected by means of an open grate, is decidedly bad. An uninterrupted ventilation is above all things essential. Without very great attention to this, an invalid, without the least suspicion of it, may occasionlly be detected breathing an unwholesome and poisonous atmosphere. And, finally, the in-door temperature should never be made to exceed that of the external air when the latter is at, or above, 60° of Fahrenheit's scale; nor should it be allowed a greater range than 8° or 10° below that point.

Food.—Change of climate invariably necessitates change of diet, and, in general terms, it may be stated that this modification should be in favour of a bland, non-stimulating class of food as we approach the equator, whilst a stronger diet, consisting in high latitudes almost entirely of animal food, will be requisite in proportion as we recede from it towards the poles.

I do not pretend to lay down a rigid code of dietetic laws; and if I did, a thousand trifling circumstances would lead to its infringement. The invalid must be entirely guided in these matters by the counsel of his physician and by his own careful observations. In illustration, however, of the discomforts which frequently follow the neglect of prescribed regimen, a case—one of many which have fallen under my own observation—may be quoted. About the second or third day after my arrival in Algiers, whilst walking leisurely across the *Place du Gouvernement*, absorbed in contemplation of the endless variety of figures and costumes which were flitting around me, I encountered an invalid who had himself but recently arrived. Speaking of the effects of the climate, which he lauded in no measured terms, this gentleman instanced one great benefit which he had already received from its influence. Previous to his arrival in Algiers, he said, he had been troubled with "a wretchedly weak stomach," and had been able to take but very little food at a time, and even that not without much annoyance. "But now," he continued, with some degree of warmth, "now I enjoy *all* my meals; I can eat twice as much as I could before I left home, and I find, moreover, that the light wines agree with me perfectly." A few days later I met the same gentleman in the *Hôtel de Paris*, whither I sometimes went as a change from the *Hôtel d'Orient*. Instead of the usual complement of dishes constituting a *dejeuner à la fourchette*, I found him in the modest enjoyment of a cup of tea and the wing of a chicken. He soon discovered, as he told me, that the full diet which the increased nervous excitation, together with the accelerated circulation of his blood, had unduly prompted him to indulge in, was only enjoyable for a limited period, at the end of which he found himself suffer-

ing from all the discomforts attending a congested liver, constipated bowels, and a very painful attack of hæmorrhoids, from which nothing but a prolonged course of abstemious diet eventually relieved him.

"For the sake of health," I have somewhere read, "medicines are taken by weight and measure, and so ought food to be." In the army and navy, as well as in workhouses and prisons, this method of meting out provisions is followed of necessity, because, without such a standard of allowance, the authorities could never determine the cost of keeping each individual; but in private life, and especially among invalids, whose appetites are generally very capricious, such biological exactness has never been attained. It would amount, indeed, to positive torture to inflict a prescribed measure or weight of food upon invalids whose digestive powers are never two days the same. All that can be demanded of them is a rational observance of certain general principles touching the quality, the quantity, and the time of taking food; so that they may be guarded against the dangers arising either from a too severe abstinence from, or an over-free indulgence in, such articles of diet as contribute to their physical wellbeing when taken in moderation. Nature has mapped out in unmistakeable characters the broad principles upon which the philosophy of dietetics must be based. She has placed a certain kind of food by the side of a certain class of the earth's inhabitants, and has fitted them with an appetite to appreciate it. We call each separate class a *zone;* it may be of *animal*, of *vegetable*, or of *mixed* diet.

According to the nature of his complaint the invalid will have experienced the necessity of avoiding certain kinds of food, probably long before he contemplated changing his residence. He will have been taught that a hot stimulating

diet aggravates his complaint; that wine imparts an injurious impulse to his circulatory system, causing congestion of the vital organs, and giving rise to a train of disagreeable consequences; that his nervous system is unduly excited by such a mode of living, and, in short, that a bland and nourishing diet is better for him. Or, on the other hand, he may have ascertained by long observation that a moderately stimulating diet, with a suitable allowance of wine or other analogous beverage, is essential to the maintenance of his health; and if so, it is undoubtedly his imperative duty to pursue such a course of living. To this I only add, that the desire for stimulating food is a growing evil, and therefore the appetite should be kept within bounds. I am by no means an advocate for total abstinence, although, I admit, I believe it to be the safe side to *err* upon, but I am of opinion that the ratio of a man's real happiness is inversely as the quantity of artificial stimulant requisite to maintain him at a certain standard of health.

Invalids rarely require stimulating food, and hot condiments should be used by them with caution. They should avoid long fasting, and never eat when fatigued by taking exercise; so that it would be well for them to rest for a quarter or half an hour before each meal. The food made use of on the Continent is less stimulating than that which we are accustomed to in this country; but the oleaginous ingredients mixed with it are almost always injurious to persons of weak digestive powers. The wines, too, are less stimulating, and are much better suited to the condition of invalids than those made use of with us. They should, however, be carefully selected, for there is a great amount of bad unwholsome wine, than which nothing can be more injurious to delicate persons. Generally speaking, two full

meals; for I have seen so much am
of temper arise out of an attempt
sidered an unreasonable hour, that I
far less danger to be apprehended fr
in the hours of diet than from the c
having to encounter dissatisfied attend
be restricted to two, or at most three,
kind; that is, without counting vege
course. After dinner the invalid oug
for at least an hour. In the evening a
ing of tea, or thin gruel, with a little dr
be found agreeable; the fluid and wa
neously imparted to the stomach have t
ating the half-completed function of dig
paring the way for a night of refreshing
in the hours of taking the various meals
means of insuring a healthy appetite, and
of the nutritious elements.

And here it may be well to mention
attention to the proper elimination of such
he system wish
rid of is of th

their use cannot be continued for a length of time without producing unfavourable symptoms.

Baths.—In the present day, when the science of physiology has been brought within the limits of the most ordinary powers of comprehension, it is surprising that the medical practitioner should find it requisite to dwell upon the utility of bathing, or to dilate upon the expediency of a clean skin. It is of the utmost importance that the invalid, above all others, should be urged to the use of means for the restoration of his health which have been employed in all ages both in preventive and curative medicine.

The body may be immersed in water of any temperature between freezing point and about 105° of Fahr.; but extreme caution is requisite when either very hot or very cold water is employed. As simple detergents, moderately warm baths are preferable to those which are quite cold; but for constant use the latter are more advisable. The Turkish bath, becoming now so fashionable in this country, is both agreeable and salutary when used with due precautions; and, when kept within proper bounds, is a form of bath that may be safely recommended. But it should ever be kept in mind that there is no luxury of a more degenerating tendency than that of a too frequent indulgence of immersion in a medium whose temperature exceeds that of the surface of the body. They who once were rulers of the world, lost their pre-eminence solely through yielding to the impulse of degrading passions, and thereby engendering pernicious habits which were probably not a little fostered by the constant use, or rather abuse, of hot baths.

Cold baths, in one form or another, should be made use of daily by every one in the enjoyment of moderate health, of whatever country, of whatever age, and of whatever condition in life. I do not necessarily mean a complete im-

mersion in very cold water, but simply a washing of the body to cleanse it from constantly accruing impurities. A great mistake, and one which is more fatal to the use of baths in this country than any other, often occurs in the method of beginning them. It is not unfrequently done in this way: A person who is not in very robust health, becomes suddenly impressed, either by reading or by conversation with a friend, with a sense of the efficacy of cold bathing in giving tone to the physical system, and energy and vivacity to the mind. Or, he may perhaps have had this salutary measure recommended to him by his medical adviser, unaccompanied by the necessary injunction against his plunging into the full career of bathing without any previous preparation. The consequence of this is, that, having for a few mornings exposed himself unclothed to probably a very cold atmosphere, whilst at the same time he continued to souse himself with very cold water, he finds *the shock*, from which he expected to derive so much benefit and gratification, not by any means so agreeable as he had anticipated; and thereupon he relinquishes his self-imposed course of ablutions under the pretext that "bathing does not agree with him."

But such is not the true philosophy of preventive medicine. A weakly person may be brought to endure a great deal of bodily exercise if properly trained to it, but not otherwise; and, in like manner, bathing is not, at all events with delicate people, to be entered upon precipitately, but gradually and with due caution.

An invalid who has been accustomed to perform daily ablutions only upon those parts of his body which are constantly exposed, may safely extend the process by gradually proceeding to sponge his arms and chest in a rapid manner, and subsequently rubbing them briskly and quickly with a

rough towel. Then, after carefully covering these, he may in like manner go through the same process with other parts, until the entire body has undergone a thorough sponging. From this system of washing he may in a little while pass on to the somewhat more severe form of *sponge-bath*, in which the body is altogether exposed, and is quickly sluiced with water contained in a *hip* or *slipper* bath in which the bather seats himself. This also should be followed by a brisk application of rough towels, in order to withdraw to the surface the blood which the water had driven upon the internal organs. For this purpose the help of an attendant may be requisite, as the exertion is frequently too fatiguing for persons of delicate constitution, and is occasionally followed by severe palpitations. Where such aid can be procured, another form of bath—the *dripping-sheet*—may sometimes be substituted with advantage for the sponge bath. It is performed in this way. A large coarse bathing towel or sheet is immersed in a vessel of water placed by the side of a dry shallow bath, in which the bather stands upright. The attendant, standing behind him, then lifts up the *dripping-sheet* by two of its corners, and suddenly wraps it round him, following this with a brisk rubbing with his flat hands until the bather is in a glowing heat. A dry sheet is then quickly substituted for the wet one, and the rubbing is continued until the body is quite dry. This is an agreeable and very safe form of bath; there is little or no exposure to the atmosphere during the whole process, which may be accomplished by an expert attendant in three or four minutes. The *shower-bath* is more severe than any of these, and requires greater caution in beginning, but is afterwards perfectly safe.

Whatever be the form of bath employed, the invalid should remember that the advantage derivable from it will

...ained to it at first; the l
avoid loitering in the subsequen
finally, he should never enter a
organs are actively employed. *A*
follow the use of cold baths, other
injurious. The term implies mere
to the surface; it is known by the r
to the previously pale and corrug
which pervades the entire system;
relief which the bather experiences i
and lungs.

Friction by means of rough towels,
gloves and belts, is an excellent adju
there is strength sufficient to bear th
the best substitute for bathing on c
cannot readily be obtained, as is so
travelling, or on board of a ship, or
venient to immerse the body in water

Sea-Bathing.—Sea-water is undou
gorating of all, and should be employ
stances permit. It is richly charge
saline ingredients, and imparts to t
revivifying effect which no other kin
Sometimes see—

employed as a deobstruent in congestion of the abdominal viscera.

Sea-bathing is employed both in preventive and curative medicine. In the former it cleanses the skin and renews its elasticity and contractility, thereby imparting additional vigour and activity to the frame, and lessening the tendency to take cold during exposure to vicissitudes of temperature. In the latter it operates much in the same way, adding firmness and tone to the textures, and so increasing the functional activity of the vascular, nervous, and secretory systems. In all cases showing impaired functional powers without any manifestation of inflammatory symptoms; in short, in those cases in which the exhibition of alteratives and tonics is indicated, sea-bathing may, with proper precautions, be resorted to. It is contra-indicated in persons of plethoric habit of body; in cerebral congestion; in organic disease of the heart, in aneurism, and, indeed, in such cases as have not the ability to encounter the severe shock; and, moreover, at certain periods in which the female constitution is not prepared for the application of powerful remedies.

Sea-bathing occasions great exposure of the body, and therefore it is proper to employ as much caution as possible during the process as well as subsequently. Invalids ought not to bathe in the sea before breakfast; nor soon after a meal. About ten o'clock in the forenoon is a convenient time, especially if the tide be nearly at its height. A hard, sandy sloping beach, with the tide at two-thirds of flood, is the best place for bathing. It is not good to enter the water when the body is cold, this chilly feeling should first be dissipated by a short walk, which, however, should be permitted to induce neither fatigue nor perspiration. The entire body should be immersed in the water as quickly as pos-

process, and subsequently
about and maintained by quic
clothing of suitable texture, an
best season of the year for sea-bat
June to October. It should not b
or three times a week at first, a
than once a day. The same cauti
an intermission of the baths, and
it is better to decrease their frequen
a stop to them suddenly. Warm
used with advantage in certain ca
ness or other cause, the sea itself ca
safety.

Clothing.—If we regard with attent
of the lower animals, we shall obser
the result of his reasoning faculties,
of experience, is in them simply th
whose munificence they are provide
ing at the least possible expense
When man does not interfere, pro
their clothing according to the nec
She divests them of their winter co
sufficiently advanced, and re-in-
covering at the

stantly lurking about him and endeavouring to find an open door of admission into his beleaguered system.

The form and quantity of clothes varies, like other elements of hygiene, with age, sex, strength, temperament, occupation, &c. Their object is to keep the body uniformly warm; to preserve it from the direct application of heat; to keep it sufficiently moist by preventing a too rapid evaporation from the surface; and likewise to protect it from too much dampness. In some particular forms of disease, too, garments made of peculiar materials are employed with a view of modifying the action of electricity. In general terms, clothes should form, as much as possible, a light, pliable covering for the body, without interfering, whether by tightness or stiffness, with the due performance of the functions of the internal organs, or the free and active use of the limbs. All tight ligatures are bad. Stays, when only sufficient to *support* the bust, may be worn without injury; but they should never be permitted to *compress* any part of the body. A free circulation is imperative, and this cannot be obtained in the presence of constricting bands. In a climate whose meteorological vicissitudes are frequent and sudden, a well-appointed system of clothing is of the utmost importance. The quality of the material employed in the construction of garments will vary according to circumstances. In our own country—if it be indeed true that our summer consists, as some have averred it does, of "three hot days and a thunder-storm"—we have obviously enough but little latitude for change of clothing. And, indeed, the most accurate meteorological observations force upon us the unpleasant deduction, that certainly three or four months per annum is all the time allowed us for other than a warm covering.

Flannel is the sheet-anchor of dress in this country. By

some who are naturally strong and healthy, and by others who, by a vigorous training, have undergone the process of so-called *hardening*, flannel is often scouted. But in these days of commercial enterprise, of bustle and activity, the community will never suffer itself to be continually under arms against disease, or to be engaged in perpetual warfare behind fortifications of multiplied baths and endless gymnastics. *In medio tutissimus.* A careful observance of hygienic laws is conducive, and even essential, to health; but this does not require a man to yield himself a slave to a daily routine of drudgery. Woollen clothing in some form is usually worn all the year round in Britain; the openness of its texture permits a free passage to the perspiratory humours, neither carrying them off too rapidly nor retaining them too long. Children and aged persons, as well as all those of delicate constitution, will find its employment essential. Winter clothing should never be suddenly exchanged for that of a lighter summer kind; a few warm days in spring often lead to dangerous consequences by throwing people off their guard; but they should always remember that cold east winds prevail until the month of June is far spent. At a suitable time a lighter kind of fleecy-hosiery may be substituted for winter flannel; and, in like manner, warmer clothing should be resumed in autumn, much sooner than is usually done, for the cold and damp mornings and evenings often contrast strongly with the warm days of that season.

In clothing the body especial care should be taken of the lower limbs. The legs and feet are often neglected. Warm woollen stockings and drawers, and especially strong water-tight boots with stout soles, are desirable. Waterproof cloaks or coats, unless freely ventilated, are very injurious, particularly when worn during active exercise;

they keep in the perspiration, and, when removed, expose the body to all the dangers of a rapid and universal evaporation. Wet garments should be changed as soon as possible; so that persons who perspire readily and profusely should replace their under garments with dry ones as often as they become damp. Others should change them frequently with a view to cleanliness. Night-dresses should be of light material; but they who wear much flannel or other woollen fabric during the day should not altogether divest themselves of it at night; a change of garments, however, should always be made. Upper garments are subject to changes of fashion, and so long as they combine the essentials of suitable warmth and ease, it matters little what material or shape they are of.

Over-coats should be made in such a manner as to be easy of application, so as to ensure their not being worn at unseasonable times and places, as is too often the case where any trouble attends their removal. Perhaps the best form of *cover-all* is one made after the fashion of the French military cloak with the hood complete, or that of a large Spanish cloak, worn after the manner of the country. The latter has the double advantage—when one corner of it is flung over the opposite shoulder—of adding to the general warmth an impromptu respirator or *cache-nez;* which to an invalid exposed to cold or damp air is decidedly a desideratum.

To these general remarks I need only add a word of caution to those invalids who are about to spend a winter in a southern climate. It is often erroneously supposed that warm clothing, over-coats, shawls, and such like articles of dress, will not be required in the country whither they are going. This is a great and sad mistake to fall into. Be it the south of France, Italy, Egypt, Algeria,

Madeira, or any other of the usual winter resorts to which the invalid is destined, he will find to his great disappointment, if he neglect to take a sufficiency of stout clothing with him, that there are cold, damp days, cold mornings and chilly evenings, even in the most favoured of these places, during which he would be very glad of his usual winter clothing.

Exercise.—Such is the intimate relation existing between the mind and the body, that whatever acts injuriously upon the one immediately impairs the other. Unless each can be made to fulfil its allotted labour there cannot follow that harmonious result which we call health. Never were two servants working under one master more jealous of each other's idleness than are mind and body. No sooner does the one leave some duty unperformed than the other obstinately refuses to fulfil the complement of its labour. They are frequently, also, envious each of the other's industry; when the body, for instance, claims too much time for active exercise, the mind complains that it is not allowed sufficient time for study, and that it is over-fatigued by the constant bustling activity of its colleague; and, on the contrary, when the mind steals a march upon the body, the latter is wont to exclaim, "unless I am allowed more time for exercise I shall not be able to go on." Both, then, must be duly exercised in their respective ways; they should be habituated to bear their individual burdens cheerfully, and without infringing upon one another's duties and prerogatives.

Exercise, physical as well as mental, should be properly adapted, both in quality and quantity, to the requirements of the invalid; otherwise its remedial influence will be unavailing, and, indeed, its effects may be positively pernicious. The circumstances of age, sex, habit, and strength,

must be carefully considered if the patient is to be benefited by it. And not these only, but his usual occupation also must be remembered. I once read a very broad but simple illustration of the latter doctrine in something like the following terms (I quote from memory):—"You would never for a moment," said the writer, "think of recommending a tailor or a shoemaker to sit down and *rest* after his long day's work; nor of saying to a postman, 'had you not better *take a walk* now that your work is done?'" Bodily exercise, to be beneficial, should be marked by regularity and moderation; the muscular, nervous, and vascular systems require a due amount of exercise, just as they demand a fit supply of food—neither too much nor too little; and directly as the proportion in which this most salutary regimen is adopted will be the efficient performance of the circulatory, the respiratory, and the secretory functions.

Two or more kinds of refreshment should never be forced upon the animal economy at the same time; eating and exercise, for example, cannot with impunity be undertaken at once; the entire nervous energy will be absorbed in the performance of one of these, to the detriment of the other; or, if not, it will be so divided between both as to be profitable to neither. When an invalid takes free exercise immediately before a meal, he uses up his nervous energy so completely as to have none, or at all events not sufficient, left to carry on the function of digestion; and hence follows a train of discomforts. Or, on the other hand, if he attempt to take exercise immediately after a full meal, he will find himself constrained by a sense of fatigue to desist, simply because his digestive system is demanding as much nervous force as he can possibly afford, and persistence in general bodily exertion at such a time would necessarily suspend the desired local activity.

Exercise should stop short of actual fatigue; it should not only be well-timed and of an agreeable character, but also moderate in quantity, *exercitum si excedat, valde periculosum.* It is one of those *good things* of which a delicate person may take *too much;* and therefore the valetudinarian will do well to guide himself in this matter rather by rule than by the measure of his inclination. There is especially one kind of individual, possessed of a highly nervous temperament and of fluctuating spirits,—now high-flown and tense, now relaxed and depressed,—who should guard particularly against that itching restlessness which requires him to be constantly walking or fidgetting, whether in or out of the house. This is not exercise any more than eating clay can be said to be taking food; it is nothing more than a perpetual wear and tear of the machinery without any profitable result.

The proper time for exercise varies with circumstances, and especially with the seasons; in summer it is too hot at noon, whereas in winter mid-day is often the only available time. Cold, raw mornings, and damp evenings, are at all times to be carefully avoided.

There are many ways in which the body may be exercised, but of these *walking* is the kind most commonly resorted to, and is, as a general rule, the best. An attractive situation, with an agreeable companion, or his own thoughts, if of a cheerful cast, are the only essentials for healthy exercise about which an invalid need have any concern. He should begin by little, and gradually prolong his journeys as he grows in strength; dividing his labours rather than doing too much at one time. Horse exercise is next in value to walking, except in some peculiar instances in which it assumes a primary importance; and the only hazard to be apprehended from it is that arising from an obstructed circulation in the lower limbs, which should be carefully

counteracted. Other occupations, such as gardening, boating, &c., are sometimes desirable; but they should never be employed without carefully guarding against a sudden check of perspiration, as well as against the danger of over-fatigue.

Children, girls as well as boys, should be allowed to enjoy that kind of romping exercise which is most congenial to their desires. You cannot prevent a child tiring itself; if once let loose to play, it never thinks of giving up its delightful occupation until it can *play* no longer; but you can see that it gets a commensurate amount of rest. Let the child romp until it wants rest, and then let it rest until it is ready to romp again; and this is spoken not of its body only, but of its mind also; for the health of the latter is quite as amenable to judicious training as the former. A well-assorted regimen, made up of a variety of books, "playthings," plain diet, plenty of water and suitable clothing, is the *totus in toto* of juvenile desideratum.

Persons who are not in robust health should not, as a rule, take exercise before breakfast; a mistaken zeal on this point frequently subjects children of delicate constitutions to unnecessary cruelty. Strong people and sturdy children may be able to bear it; but they whose entire system is for a time, or habitually, *below par*, will find it advantageous to begin their day's work with a comfortable repast. Exercise should alternate with rest; the invalid should not be content with his *night's sleep*, of which we are next to speak; but should allot to himself additional seasons of repose throughout the day, and this is more especially the necessity of delicate children, who, from their activity, are easily and quickly fatigued, and therefore require a more than ordinary amount of rest. Let me add, that in warm climates, such as those in the south of Europe, the invalid should be

cautious in exposing himself to the sun's rays during the spring months. At this season they are very powerful, but they do not equalise the warmth of the atmosphere so much as in summer; so that in crossing from sunshine to shade, a marked diminution of temperature occurs, which may act injuriously on a weakened system. At such a season he should clothe himself for out-door exercise conformably to the indication of a thermometer kept constantly in the open air, but always in the shade. And when walking in the sunshine, he should protect himself by means of a parasol or light umbrella from the direct solar rays.

Of *mental* exercise I have but little to add; it is a subject fitted rather to the pen of the moralist than to that of the discursive hygienist. The mind cannot enlarge itself, any more than the body, without suitable and sufficient food; nor can it assimilate the elements which are offered to it without a proper amount of intellectual exercise. He, therefore, will thrive best who, by the assiduous cultivation of his intellectual faculties, and a due attention to his bodily requirements, secures to himself *mens sana in sano corpore*.

Sleep.—Of all the balms that can be brought to bear upon the sufferings of humanity, none is equal to that of sleep. Whether from pain of body or distress of mind, whether from aching limbs or from an aching heart, there is no nepenthe so powerful to relieve the tortured frame as sleep. Happy is the man who can win it at his pleasure, and greatly is he to be commiserated from whose eyelids "life's nurse" is banished, leaving him to pass in weary watchfulness those hours wherein the careless find repose.

> "It seldom visits sorrow; when it doth,
> It is a Comforter."

The amount of sleep requisite to maintain the body and mind in health depends upon a variety of circumstances, of

which age, sex, strength, temperament, employment, and habit, are so many. Sleep occupies about one-third of a lifetime. Infants sleep more than half their time; children nearly half, and adults about one-third. Elderly people dose and slumber much, but sleep comparatively little. Women require rather more sleep than men; but in times of anxiety they bear a deprivation of it with more patience and greater fortitude. Delicate persons always require more sleep than others who are in robust health, and they cannot sustain a prolonged watchfulness. This is more particularly the case where the person is at the same time employed in a business of an exhausting nature; and it will be modified, moreover, according as his temperament approaches the nervous or the phlegmatic type. Nothing can be more easily converted into a mere matter of habit than the time allowed for sleep. There are cases on record of men who have reduced the amount which they partook of this essential restorative so low as four, three, and even *one* hour in the twenty-four. It was said of Pichegru, that during a campaign of a year's duration he never slept more than one hour in the twenty-four. Others again, on the contrary, have so accustomed themselves to a life of despicable slothfulness, as to leave but a few hours of each day for the pursuit of the ordinary duties of life, and of this, doubtless, much will be spent in eating and drinking. Nothing but careful observation can enable any one to know when he has slept enough; and it is the want of such care that so frequently leads to the pernicious error either of enjoying too little or of taking too much. By a very little practice an invalid would be able to awake precisely at the time when he has slept long enough. (I am speaking of those who sleep regularly, and who are able to move about freely) he should rise immediately. Most adults require more than eight hours.

sufficient; more is usually taken. It is an acknowledged axiom, that all sleep obtained before midnight is *golden* sleep, and invalids especially should get as much as possible of it. Early rising is the counterpart of the same axiom; but early rising may be carried too far. The valetudinarian will probably seldom be later than *ten* in retiring to his room, and this will leave him little enough of time for *golden* sleep; then in summer he should be ready for breakfast not later than eight, and perhaps half an hour later than this in winter. Let him not be over-fatigued nor excited, whether by talking, reading, or thinking, when he retires to rest; let him avoid late eating, and then, if his room be properly ventilated, and his bed be neither too soft nor too hard, but pliable and elastic, the invalid may fairly expect a good night's rest.

Many schemes have been adopted for the purpose of inducing sleep at times when it is not likely to come of its own accord. The common tendency of all these is to fatigue the brain by their monotony, whilst, by reason of their familiarity, they do not give rise to any excitement. Counting slowly, repeating well-known verses of Scripture, hymns, or other metrical lines; counterfeiting sleep by deep and prolonged respiration, in short, whatever can engage the mind so as to weary it without occasioning active thought—for thinking and sleeping are incompatible—may be resorted to as harmless decoys to sleep. Dreams are indications of imperfect sleep; whence they come and what they are is enveloped in mystery. Their presence tells us that at least one of the cerebral functions is not at rest. Change of diet, a modification of the rules of exercise, a better ventilation, or other trifling circumstance, will frequently free the invalid from their baneful influence. That sleep is most refreshing which is least beset with dreams.

CHAPTER III.

MINERAL WATERS.

It is a common practice to prescribe either an antecedent or subsequent course of mineral waters in conjunction with change of climate. Many invalids derive great benefit from such an arrangement who would have reaped but a moderate advantage from either the one or the other if undertaken alone; and it is in order to facilitate the combination of two remedial agents of acknowledged worth that I have added to the general description of winter resorts a concise account of such localities as are in reputation on account of their mineral springs.

I need not dwell upon the history of such waters, nor relate the manner in which the utility of certain springs was first discovered, nor tell of the rise and fall of a thousand watering-places, ancient as well as modern. The vicissitudes of fashion are as marked and as uncontrollable in the matter of mineral waters as in that of change of climate. A few standard places maintain their position, but a crowd of new ones spring into notice at each succeeding season, whilst others, which have exhausted their brief reign, fall into neglect.

Every variety of water contains more or less of foreign substances in solution, to which it owes its peculiar taste,

odour, or outward appearance; so that every spring yielding a good potable water might with propriety be termed a *mineral* spring. Distilled water is nearly pure, and hence its flat, insipid taste. The epithet, however, is usually confined to such as yield a water containing a larger quantity than usual of mineralising ingredients, sometimes of high temperature, and, generally speaking, known to medical men by its influence upon certain forms of disease. Every country possesses such springs to a certain extent, although they do not all pretend to the same merit in a medicinal point of view.

The sea affords the most uniform example of a mineral water; for it holds in suspension every variety of tellural ingredient, carried into it by innumerable rivers, as well as certain principles peculiar to itself, which land springs do not usually possess. In addition to other ingredients, it contains the chloride and bromide of sodium, the chloride of potassium, the chloride of magnesium, and the sulphate of magnesia, the carbonate and sulphate of lime, and traces of the oxide of iron. Moreover, its temperature changes only to a trifling degree.

Mineral waters derive their ingredients generally from the soil or rocks through which they pass in their way to the surface of the earth. They contain, besides a variety of saline principles, a certain quantity of organic and inorganic substances, together with more or less of a free gas, either sulphuretted hydrogen, carbonic acid, nitrogen, or oxygen, as well as a little atmospheric air. The two varieties into which these waters are generally first divided are hot or thermal, and cold; and, secondarily, they are classified into gaseous or acidulous, sulphurous, alkaline, chalybeate, bromo-ioduretted, and saline.

It would be profitless to enter upon the discussion as to

the cause of the elevated temperature observable in what are termed *thermal* mineral springs; whether it arises from the influence of the globe's internal heat, from chemical decomposition, from the agency of electricity, or from the proximity of active volcanoes, is alike indifferent to those who desire to be simply practically acquainted with their medicinal effects. Before proceeding to an inquiry into the nature and therapeutic actions of the varieties of springs already enumerated, let me premise a few sentences upon the general mode of action of these waters.

Mineral waters are administered both internally and externally; and in both of these modes of exhibition their influence differs according to their temperature, and to the variety and strength of their mineralising ingredients. When taken internally they act as depuratives, more or less, by improving the functional powers of the secretive and excretive organs, whether by stimulating them when sluggish, or by soothing them when impaired by irritability. The skin and kidneys are especially under their control. Beyond this general effect they act in a variety of ways, according to their dominating ingredients. Externally they are applied in several forms of baths, by means of which the skin is cleansed from impurities, its functional powers are increased, the internal organs are relieved by a determination of the fluids to the surface, and, moreover, an appreciable amount of the mineralising ingredients of the water is absorbed into the system, there to work its own peculiar influence, according to the nature of its composition, and the condition of the invalid at the time. These baths may be either universal or topical, according to the necessities of the patient, and the medium may either be that of the water itself, the gas or vapour which escapes from it, or the *mud* which it deposits.

Mineral waters usually contain in greater or less quantity some, or all, of the following salts: the hydrochlorates, sulphates, and carbonates of soda, lime, magnesia, potassa, alumina, baryta, strontia, lithia, and manganese. Besides, there are occasionally found bromine and iodine, and a variety of metallic salts, such as those of iron, copper, arsenic, and such like. In addition to these ingredients, a few springs are impregnated with what has been imperfectly described as an *organic-vegeto-animal* substance known by the names of *baregine*, *glairine*, or *zoogine*, as well as by another substance called *sulfuraire*. The former of these is of an amorphous, gelatinous consistence, and of varying colour, density, and quantity; its constitution and office is but imperfectly understood, but it is supposed to give rise to the *chicken-broth* odour of some springs. The latter is an organic substance, and belongs probably to a species of confervæ. A few words on each variety of mineral water will suffice.

1. *Gaseous or Acidulous Springs* are those which, in addition to their mineralising principles, are charged more or less fully with carbonic acid gas. This gas escapes with greater or less rapidity after the water is free from pressure, and exposed to the air. Sometimes its escape gives rise to considerable noise, especially when the waters find their first freedom in a cavernous rock, as in the case of the Acqua di Tamburo, in the Island of Ischia. Acidulated chalybeate waters usually deposit a large portion of their ferruginous ingredients soon after their escape, in consequence of the loss of the gas which had previously held it in solution. After the escape of the gas the waters have a flat, insipid taste; but when taken whilst still strongly charged with it, they are refreshing and stimulating even almost to inebriety. The kind of cases to which this class of springs is applicable

depends upon their further constitution. The effect of the gaseous principle is to allay irritability of the digestive system, to increase and modify the secretion of the kidneys, and to stimulate, or rather to exhilarate the nervous system. Besides this, it imparts an increased activity to the other ingredients, rendering them more powerful in their effects upon the system. Such springs should be administered cautiously at first, for they sometimes produce unpleasant symptoms, of which fulness in the head is the chief. They should never be administered during active febrile or inflammatory conditions, nor where there is any tendency to apoplexy. They are essentially useful in certain varieties of dyspepsia. We have examples of this class of mineral waters in the springs of Ems, Wiesbaden, Schlangenbad, Gurgitello (in the Island of Ischia), St Nectaire, Bath, Bristol, Buxton, &c., all of which also belong to the thermal class; besides those of Tunbridge, Cheltenham, Pitcaithly, Enghien, Pyrmont, Selters, Marienbad, Geilnau, Spa, &c., which are cold.

2. *Suphurous* springs are characterised by the presence of hydrosulphuric acid either in a free state or in combination with a base in the form of a hydrosulphate. They usually emanate from beds of the primary formation, or if not, their existence may be generally attributed to some accidental circumstance, by means of which a spring of a different class has become impregnated with sulphuretted hydrogen. The sulphur may be in the form of a sulphuret, as those of sodium and calcium, or it may exist in the gaseous form of sulphuretted hydrogen; or it may be that, after contact with the atmosphere, the sulphuret has become converted into a sulphate, and then we may call it with M. Anglada a *sulfureuse dégénérée*. It is to the class of sulphuretted waters that the substances known as *Glairine* or *Baregine* and *Sul-*

furaire belong. The odour peculiar to sulphurous springs is due to the escape of sulphuretted hydrogen gas; but the intensity of the odour is by no means a just criterion of the strength of the water; on the contrary, the stronger the smell of a water known to be largely impregnated with a sulphuret the weaker it will be, because the odour is due to the decomposition of the salt. Whereas, if that disagreeable physical characteristic be less powerful, it may betoken a greater strength of the water, because its absence indicates that there is less of the essential ingredient passing off into the atmosphere. The most effective sulphuretted waters do not give off their characteristic *rotten-egg* odour when first drawn, although they all do it after exposure for a short time to the air. This is, perhaps, the most powerful class of mineral springs that can be recommended as simple alteratives. They are administered both internally and externally; but those of high temperature are the most active, such as require the aid of artificial heat to prepare them for bathing purposes being decidedly inferior in medicinal value. They act especially upon the mucous lining of the digestive organs, upon the kidneys, and upon the skin, whose functional activity they alike increase. According to the proportions of other ingredients, they add to the effects already mentioned a deobstruent and laxative influence, by their action on the secreting organs. They should be commenced with extreme caution, gradually increasing the dose, if taken internally, or the duration and frequency of the bath, as the case may be. If headache supervene, accompanied by a rapid pulse, together with a feverish and sleepless condition of the system, their use should be diminished, if not intermitted for a season. Their exhibition is indicated only in chronic states of disease. They are considered valuable remedial agents in chronic

gout and rheumatism; in cutaneous diseases; in advanced cases of syphilis; and in many forms of functional derangement of the uterus. In scrofula; in diseases of the joints and in old cicatrices; in the elimination of accumulative medicines, such as mercury; in some forms of chronic bronchial and pulmonary affections, they are likewise recommended. We have examples of this class of mineral waters in the thermal springs of Aix-la-Chapelle, Bareges, Cauterets, St Sauveur, &c.; and in the cold springs of Enghien, Weilbach, Harrowgate, Moffat, Strathpeffer, &c.

3. *Alkaline* springs are characterised chiefly by the presence of the carbonate or bicarbonate of soda in considerable quantity, and in a less degree by the presence of the carbonate of lime and magnesia. They contain a variety of mineralising ingredients besides these; but it is to the carbonate of soda especially that they owe their medicinal reputation. They are usually more or less impregnated with free carbonic acid gas, so as to belong, in part, to the class termed gaseous or acidulous. These waters allay irritability of the mucous membrane lining the digestive apparatus, due to the presence of an uncombined acid; they are sedative in their effects upon the nervous system generally; and act also, like other mineral waters, by increasing the functional activity of the skin and kidneys. They are recommended in certain kinds of dyspepsia complicated with acidity; in chronic bronchial and pulmonary affections; in chronic cutaneous affections; in calculous disorders; in diabetes and Bright's disease of the kidneys; in gout; in glandular enlargements; in organic and functional disease of the uterus, &c. Their exhibition requires extreme caution, not only in the selection of a suitable spring, but also in the mode of administering the waters. The *Grande Grille* at Vichy is the principal spring of this

kind; and, besides that, other thermal springs, as those of Ems, Mont Dore, Ischia, &c., as well as the cold springs of Bilin, Vals, Ilkestone, Malvern, &c., have the same predominating constitution.

4. *Chalybeate* springs are characterised by the presence of an oxide of iron, and may be either acidulated or saline. The former are much more active, and should be administered where there is a want of nervous energy; and the latter, where there is a tendency to head symptoms, the usual result of treatment by ferruginous waters. In all cases showing a want of red blood; in scrofula and other vitiated conditions of the system; in functional disorders of the uterine system; in chlorosis; in nervous disorders, as hysteria, epilepsy, and chorea; in spermatorrhœa; in local nervous pains, and in many other disorders, the exhibition of chalybeate waters is indicated. The bowels should be carefully regulated during their administration. This variety has so many representatives, that it is impossible to make a small selection; the springs of Mont Dore, St Nectaire, Vichy, Töplitz, and Bath, may pass for examples of the thermal class, and Pyrmont, Spa, Tunbridge, Hartfell, &c., for the cold variety.

5. *Bromo-ioduretted* springs contain in combination with iodine and bromine usually the bases of sodium or magnesium. They are employed as alteratives and tonics in derangement of the lymphatic and cutaneous systems. They are indicated in strumous affections, in which they exercise a beneficial effect, especially apparent where there is marked glandular or cutaneous manifestation of the disorder. They are also recommended in cases of uterine derangement; in visceral congestion, and occasionally in rheumatism and gout. We have examples of this variety in the springs of Kreuznach, Kissingen, Homburg, Woodhall, &c.

6. *Saline* springs contain a variety of salts, and for the sake of easier description are usually divided, according to the acid which enters into their constitution, into *muriated* or *chloruretted*, and *sulphated*. The *muriated* saline springs are characterised by the presence of chlorides or muriates in preponderating quantity, although they may be associated with other ingredients, to which chiefly the medicinal reputation of the spring is attributable. The principal ingredients are the muriates of soda, lime, and magnesia; to which may be added in smaller quantities the carbonates and sulphates of soda, lime, magnesia, and iron, together with bromides and iodides, as well as a certain amount of free carbonic acid or sulphuretted hydrogen gas. Their action is alterative, slightly purgative and tonic; and they are employed in a variety of diseases according to their combination with specific remedies, such as iron, sulphur, iodine, bromine, &c.

The sulphated salines are characterised by the presence of sulphates in excess. They usually contain either the sulphates of soda (Glauber salts), of magnesia (Epsom salts), or of lime, frequently associated with the sulphate of potash, the muriates of soda and magnesia, and the carbonates of soda, lime, magnesia, or iron, together with more or less of free carbonic acid gas. In the case of the Sandrock Spring in the Isle of Wight, the sulphate of iron is in excess. Their action is aperient and alterative, and they are generally heavy of digestion, unless mixed with carbonic acid gas. They are employed in cases requiring interference in the action of the secretive and excretive organs, to which they impart a decided stimulus, and through them relieve the system of many disorders.

Mud Baths are formed of the soft earthy substances brought by certain mineral waters to the surface of the

earth and there deposited. They are applied either locally or generally, and in many diseases are considered more active than the waters themselves. They are used at many bathing establishments, such as Barbotan, St Amand, Acqui, &c., in a variety of diseases, of which chronic rheumatism, cutaneous affections, indolent ulcers, pseudo-anchylosis, injuries and diseases of the joints and bones, &c., are examples.

It will be at once apparent, from the excursive nature of these remarks, that general information upon the subject of mineral springs is all that is intended to be conveyed by them. The reader will find further details as to the merits of particular springs under the individual descriptions hereafter following; but I would add here, that book-learning, in this as in everything else, is far inferior to the knowledge to be obtained by a comparatively brief practical experience of the qualifications of such waters. And therefore I strongly recommend both physicians and invalids who are unacquainted with the practical application of these agents, to make no more use of written treatises on the subject than is sufficient to enable them to make a judicious selection according to the nature of the case to be treated. Having done this, let the patient next be consigned to the care of one or other of the intelligent medical men who reside in the neighbourhood of the particular bath which has been chosen. He will then conduct the case to a favourable termination, if it be within the power of the waters to effect it, or he will conscientiously recommend such changes as may be most advantageous to the patient. I can conceive of nothing more dangerous, in ordinary medical treatment, than for an invalid to take a course of mineral waters without proper instructions; nor is it advisable that he should pursue undeviatingly any course

prescribed by his medical adviser at home, because many circumstances may interpose to render the strict following of such a plan highly inexpedient, and these are circumstances which a practitioner experienced in the use of the waters can alone understand and controvert.

But there are a few general rules regarding the concomitant behaviour of the invalid desiring to be benefited by a course of mineral springs which it would be well for him to be acquainted with. It has been said, and doubtless somewhat truthfully, that it is rather to the change of the mode of living, to the excitement attendant upon a residence in a new locality, to the charming scenery which usually surrounds the position occupied by mineral springs, to the well-ordered diet and regimen, to the gaiety of the place, or to the whole or to a part of these circumstances in combination, that the invalid owes his recovery, rather than to any specific action of the mineral waters. I believe that the two react upon each other, but I do not believe that even all the above, and many other available collateral circumstances, would of themselves operate a cure in the absence of the mineral water in many of the cases of disease which resort to these springs; although I can easily realise the idea of the mineral springs frequently failing to recover the patient, if they could be shorn of their allies. Mineral waters are undoubtedly efficient remedies in certain forms of disease; but they are hazardous, and even imminently dangerous, in others. The selection of a spring, the times of drinking, and the amount to be taken; the periods of bathing, their frequency and duration; the proper seasons of intermission; the diet and regimen suitable to the well-being of a patient undergoing such a course of treatment, are items of considerable importance, a neglect of any of which will be observable in the general result.

CHAPTER IV.

A SKETCH OF THE DISEASES IN WHICH CHANGE OF CLIMATE IS COMMENDABLE AS A REMEDIAL AGENT.

In making a rapid survey of the diseases in which change of climate is reputed to act beneficially, I would again remind the reader of the importance of regarding this agent rather as a medium through which a cure may be wrought, than as the direct instrument by which the improvement is to be effected. The invalid, in fact, is to employ all the means in his power to the restoration of his health, and to avoid all causes of provocation to the increase of his malady, with just as much care in a new locality as he would have done if he had remained at home. I shall endeavour to make the remarks upon the following diseases as concise as possible, so that, whilst they may be sufficient to refresh the memories of those who are to take upon themselves the responsibility of sending a patient into a distant land, or, at all events, far from his own home, they may not, by trenching upon the functions proper to extensive treatises on the general principles and practice of medicine, become presumptuous or wearisome. It is only with chronic diseases, or with the sequelæ of acute disorders, that we are to deal; for in such cases only can change of climate be resorted to, except as a prophylactic to various maladies.

Ague.—It scarcely requires to be mentioned, that re-

moval from a malarial district is essential to the ultimate recovery of a patient suffering from intermittent fever. This disease manifests itself in certain regions, whilst others, with the exception of sporadic cases, arising from purely local causes, are entirely free from it. It requires for its propagation a peculiar condition of the atmosphere, such as generally hovers over swampy, uncultivated land, and a temperature of not less than 60°, which must have influenced the atmosphere without abatement for several weeks; hence autumn is more liable to epidemics of this disease than any of the weeks in spring or early summer, even though marked by a like temperature. A cool temperature, and a moderately dry atmosphere, at a certain elevation above the level of the sea, are the requisites for patients of this class. It is curious that *Venice* should be held in reputation as a resort for such invalids, and yet experience has shown that a residence there is quite compatible with an entire removal of the disorder. The sequelæ of intermittent fever are frequently ameliorated by a judicious course of mineral waters, of which the muriated saline are usually best adapted.

Anæmia, chlorosis, cachexia, are all nearly allied, and are characterised by the same vitiated state of the blood, which arises from insufficient or improper food; bad ventilation; want of exercise; abuse of spirituous liquors, or of a variety of drugs; syphilis; exhausting trades; manustupration; debilitating discharges; imperfect menstruation, &c. Although anœmia differs from chlorosis, and both of them are distinct from the several varieties of cachexia, yet they may be appropriately classed together here; for in all of them change of air, moderate exercise, well-ventilated apartments, cheerful scenery, a well-regulated, nutritious diet, and suitable mental occupation, together with a judi-

cious exhibition of alterative and tonic medicines, are indicated. Gentle travelling from place to place; a sea voyage, when it can be undertaken in comfortable circumstances; or a residence in a moderately dry and somewhat tonic atmosphere, may be recommended in such cases, together with a proper use of mineral baths, and the internal administration of chalybeate waters.

Apoplexy.—In cases showing a disposition to a full, plethoric habit of body, in which a termination in apoplexy might be feared, climates of a sedative tendency should not be recommended. A slightly tonic but not irritating atmosphere is best adapted to them. Such patients should take moderate exercise in the open air, but not so much as to cause exhaustion; they should avoid the direct rays of the sun; their diet should be light, their drink of a non-stimulating kind, their sleep not too protracted. They should avoid evening entertainments, and excitement of all kinds. The bowels should be kept sufficiently relaxed to prevent straining. Mineral waters should be used with a very sparing hand, and with the utmost caution, if at all; and bathing should be resorted to only in a very careful manner. The feet should be frequently bathed in warm water, and the head may be treated occasionally, unless there are special indications to the contrary, with cold affusions.

Asthma may be either idiopathic or symptomatic. When it is the latter, treatment should be applied to the cause; and if that can be removed, the troublesome symptoms will disappear. Change of climate is frequently followed by marked benefit in asthma; but it is one of those capricious disorders to which it is difficult to assign a specific locality. The climate that relieves one patient aggravates the disease of another. Frequently a removal of not more than a mile; from one part of a town to another; from an elevated posi-

tion to a lower one; and even changes apparently more trifling than these I have known to operate a never-failing relief. Some cases do well in the fitful, but generally cold and dry climate of Montpelier; others at Nice; whilst a third class improves under the sedative atmosphere of Rome or Pisa. Each case, however, must be judged by its peculiarities, and be sent accordingly to a dry, bracing, or a warm and somewhat moist air, as it may seem to require, or as the patient's experience may suggest. A course of mineral waters, especially where there is much irritation of the mucous membrane lining the air-passages, will in almost all cases prove successful, if properly administered. In recommending their use, the locality in which they are situated should be taken into consideration; a lofty mountainous position may be agreeable to one case, a secluded valley to another. Each variety of asthma, whether humoral, congestive, or spasmodic, has its own eclectic peculiarities, and will not submit to any definite system of climatological interference; but, generally speaking, the mild climate of the south-west coast of England, of Queenstown in Ireland, and, perhaps still better, the climate of Buteshire in Scotland, are the kinds most frequently successful.

Bronchial and Laryngeal affections are amongst those to which change of climate is most beneficial. It is only, however, in their chronic forms that this remedial agent can be brought to bear upon them; and the invalid should be particularly cautious, even when suffering from this disease in its chronic form, that he does not by any careless exposure to cold currents of air, by visiting cold churches or picture-galleries, or by too rapid travelling or too high living, convert his complaint into one of an acute character. This may be easily done; and, moreover, it would probably be followed by symptoms of an

alarming nature. A previous preparation by moderate living, by the use of simple alterative medicines, the regular use of bathing and friction, a well-regulated diet, and a moderate amount of out-door exercise, will be of material advantage to the patient. He should set out for his winter quarters during the month of September, arriving at them by easy and careful journeys. His diet should consist of light nourishing food, with a moderate allowance of wine, according to his condition; but the latter had better be omitted altogether if it give rise to derangement of the digestive system—a danger to be at all times carefully guarded against. His apartments should be well chosen for their aspect, airiness, and good prospect; they should be kept dry, tolerably warm, and well ventilated. He should take sufficient out-door exercise without exposing himself to the direct rays of the sun, from which he may protect himself by means of a light umbrella, or to the cold and damp air of the mornings and evenings. Especially he ought to avoid evening visiting in hot over-crowded rooms. On dull days he should have a fire constantly in his sitting-room; and during the prevalence of cold, harsh winds he should remain in-doors. His clothing should be sufficiently stout to protect him in a measure from vicissitudes of temperature; flannel next the skin being by far the best. A loose overcoat and strong boots are also essential. His baths should be carefully continued. In addition to the qualifications of mildness and equability, the climate to be selected in such cases will require to be of a dominating dry or humid character, according to the condition of the patient. If he be of a leuco-phlegmatic temperament, with a flabby atonic muscular system and a copious bronchial secretion, a dry and rather invigorating climate will be indicated; such as the Undercliff, Clifton, the milder parts

of Brighton or Worthing, Montpelier, Nice, Algiers, Egypt, &c. If, on the contrary, he be of a nervous temperament, with a dry and sensitive condition of the air-passages with little or no expectoration, a mild but more humid climate should be recommended; such as Torquay and the south-west coast generally; Bute, Queenstown, Pau, Rome, Madeira, &c. A summer tour to any of the watering-places in lofty situations, such as those of the Pyrenees, together with a careful course of mineral waters, form an excellent adjunct to the benefits previously derived by wintering in a mild climate.

Calculi (*Urinary*).—It has been supposed that change of climate has to a certain extent an influence over the formation of concretions in the bladder, or, at least, that it prevents under certain circumstances the formation of such deposits in the urine as might ultimately lead to the construction of a calculus. It is said that the natives of a very hot or of a very cold country are less subject to this disease than those of a somewhat moist, temperate, but changeable climate. But so many difficulties arise out of the questions as to the relative effect of diet and temperament, that, with the few data we have to rely upon, it is scarcely possible to form a just estimate of the value of change of climate in preventing the occurrence of this disorder. There can be no doubt, however, of this, that where there is a tendency to the formation of urinary calculi, they will be less likely to arise in a climate in which the patient enjoys comparative health, and in which the balance of his digestive and assimilative powers is most equally maintained. It is quite impossible to name any particular climate in which such would be the case; that must depend upon the constitution of the individual. Sir James Clark seems to think that Pisa enjoys an immunity from this malady; he says that

Vacca, during thirty-two years in which he had been operating upon patients from all parts of Italy for calculus, never encountered a Pisan. Certain mineral waters, as those of Vichy and Carlsbad, are reputed efficacious in the reduction by solution of these formations; but I think it is unlikely that calculi, which are usually composed of alternating structures, can yield to any one solvent; and if not, then the experiment is not void of danger, and should not be recommended. Their judicious employment in the lithic acid diathesis, antecedent to the formation of a solid concretion, might perhaps be advantageous.

Catamenia.—The due performance of the uterine functions is so dependent upon the general tone of the system, that it cannot for a moment be doubted but that a careful observation of the general laws of hygiene will go far to maintain them in a healthy state. Pure air, cleanliness, proper food, moderate exercise, sufficient clothing, a suitable attention to the alimentary and excretory functions, and the observance of regular hours of rest, are not only essential to the safe induction of these functional powers, but likewise to their proper performance at each recurrence of uterine activity, and ultimately to the safe conduct of the individual through that climacteric period at which the catamenia cease. The time of life at which the generative system is brought into a condition of activity, the varying rapidity and the diversity of symptoms which accompany its development, are so much influenced by climate, that it is impossible to avoid the conclusion that in it we have a useful remedial agent, applicable to certain uterine derangements, whether at the outset of the functional activity of that organ, or at a later period. A removal to a warm climate, in certain cases where the appearance of the catamenia is delayed beyond the ordinary period, is frequently attended

with a marked amelioration of the previous symptoms. At other times, a change from a warm relaxing climate to one of a tonic character, accompanied or not by a course of chalybeate waters, would probably be followed by an improvement in the health of a patient suffering from any such derangements. Besides the ordinary functional disorders, there are others of an organic nature which are amenable to a judicious combination of climate and mineral waters, several of which will be found mentioned in the descriptions of certain suitable winter and summer residences; but it is beyond the scope of this work to enter into the individual cases, or to do more, in fact, than call the reader's attention, in passing, to a subject which he will find fully discussed in works appropriated to it.

Climacteric Diseases.—The word *climacteric* is usually employed to denote that period of life at which what is commonly called the *breaking up of the system* takes place; or in other words, the last grand perceptible change which occurs in the physical constitution at a variable period from the time of its final dissolution. I take it here, however, to signify those several changes which take place in the human frame at various intervals from infancy to old age. Childhood may be considered the first of these. It is the season at which hereditary diseases manifest themselves, or at least in which they may be expected, and against which all the prophylactic agencies at our command should be directed. A child born of consumptive parents, or whose ancestors have been afflicted with any form of cachexy, will have a better chance of stifling the germs of the same disorder implanted in his own constitution if reared in a genial climate. Children who are recovering from a long illness, even the ordinary diseases of infancy and childhood, especially hooping-cough, are remarkably susceptible of the in-

fluence of change of climate. Again, at the age of puberty in both sexes, the same remedial agent may frequently be applied with great advantage. At another epoch, the too eager and industrious student, or the over-wrought man of business, will find in change of scenery, and in a diversion of the usual current of his thought and occupation, a valuable regenerative agent whereby his shattered strength may be renewed. The adult convalescent will likewise find in a temporary change of residence a mean of restoration to health such as no course of pharmacological treatment could effect. And then, finally, during the *grand climacteric* the constitution is exposed imminently to a variety of diseases which it is the duty both of physician and patient to obviate by such anticipatory remedies as may be suggested by the individual cases. Change of climate, to a greater or less extent, is one of the most powerful prophylactic agents at such a season, and more especially so if the patient have spent any portion of his life in a tropical climate.

Catarrhus Epidemicus—Influenza.—Change of climate during convalescence from this debilitating disorder is in many instances of the utmost importance. It is frequently the only remedy left to quell the last long lingering effects of the malady, which may at a late stage become converted into one of an obstinate chronic form, accompanied by complications of a hazardous nature.

Chorea and *Hysteria* are both amenable, at a certain stage, to change of climate. The first object to be attained is the removal of the immediate cause by the exhibition of suitable remedies, as purgatives, deobstruents, counter-irritants, emmenagogues, &c., and subsequently the removal of the predisposing cause by means of change of scenery, moderate exercise, a well-regulated diet, a careful attention to the secretory and excretory functions, and by the administra-

tion of tonic medicines, chalybeate waters, various kinds of baths, and so forth; but especially by bringing the mind into a proper tone under the influence of cheerful society and attractive scenery, as well as by the perusal of standard literary works of moral worth.

Cutaneous Diseases.—It is impossible, within the narrow limits to which I am confined, and in a work chiefly devoted to medical topography, to enter upon the question of the classification of skin diseases, or of their treatment. Many of the disorders which make their appearance upon the surface of the body are merely so many symptoms of internal functional derangement, as of the digestive organs; or are indicative of the presence of a *materies morbi* in the blood, as in the case of syphilitic eruptions; or else denote a general constitutional cachexy, as in scrofulous affections. In any of these cases the treatment is such as to influence the cause, and not directly the effect; it is constitutional rather than topical. Change of climate is often of great service in such cases, and when combined with a discriminating use of mineral waters, administered both internally and in the form of baths, it is a remedy which may be recommended with advantage. Great care should be observed in the selection and manner of using a mineral water, and the patient should place himself under the guidance of a practitioner well acquainted with the effects of the spring to which he resorts, otherwise he may inflict grievous if not fatal consequences upon himself. In the description of the various places mentioned hereafter, the reader will find reference made to a variety of skin diseases for the cure of which they are more or less reputed.

Dyspepsia is one of the disorders in the alleviation of which change of climate is pre-eminently successful. Indigestion arising from a general derangement of the system

caused by a too close application to study, or to business, by an untoward indulgence of the depressing passions, or by any cause whatever unaccompanied by organic lesion, may almost without fail be mitigated, if not altogether cured, by judicious change of air and a well-assorted regimen. But it is in the chronic form only that such a mode of treatment is resorted to. I do not think it necessary to occupy either time or space in describing the various symptoms which attend the different kinds of dyspepsia. The forms usually described are the *inflammatory or gastritic;* the *nervous or irritable;* and the *atonic.* These varieties, however, seldom preserve their individuality for any length of time, although they are always marked by certain distinguishing features by which they can be readily classified. In recommending change of climate in such disorders, it will be essential first of all to secure an accurate acquaintance with every particular feature of the case, both of those which are apparent and of others of a masked kind. Not unfrequently there are cases to be met with in which the outward manifestations of the disease are calculated to throw the practitioner off his guard, by pointing to organs as the real seat of the malady in which in truth there is nothing wrong beyond a sympathetic disturbance which would vanish on the removal of the true disease. Bronchial and pulmonary diseases, for instance, are very often suggested by the patient to his medical adviser, and without a careful diagnosis he might readily fall into the same error, whereas the symptoms manifested in the chest and throat may be simply dependent upon a disordered condition of the digestive apparatus. Having ascertained the exact condition of the invalid, it next comes to be a question, if a change of climate be deemed advisable, as to the choice of a locality. If the dominating symptoms show the case to belong to the inflammatory type, the

patient should be recommended to travel leisurely and cautiously, avoiding excitement of every kind, whether from exercise or diet. In the first instance a sedative climate should be recommended, such as that of the West Coast in this country, or such an one as that of Pau, Pisa or Rome, on the Continent. A dry irritating climate is contra-indicated. If the case belong to the *atonic* variety, precisely an opposite course must be pursued; instead of a sedative climate, one moderately stimulating, as those of the uplands in our own country, or as those of Nice, Montpelier, Genoa, many parts of Spain, Algeria, Egypt, &c.; for although some of the latter are not so tonic in their effects as might be desired, nevertheless the thorough change of scenery is often of unparalleled importance in these cases. Indeed, it is by variety of scenery, freedom from care, and a moderate amount of excitement, that climate operates in this form of the disorder. The *nervous or irritable* form of dyspepsia falls to be treated by a class of climate intermediate between the stimulating and the sedative, or by one approaching in character to either of these, according as the disorder inclines towards the inflammatory or the atonic type. Moving about from place to place is perhaps the best method of treatment in this as in the atonic variety, provided it be done in a cautious manner, so as to avoid over-fatigue, or any other cause which could give rise to an accession of inflammatory symptoms. Dyspeptic invalids especially should attend to the suggestions laid down in a previous chapter on hygiene. The previous preparation, the manner of travelling, the choice of a residence, the regulation of diet and regimen, are of the utmost importance in these cases. In the absence of inflammatory symptoms, and where there is no organic lesions, a well-regulated course of mineral waters will add to the advantages derivable, in cases

of dyspepsia, from change of climate, especially where they are complicated with congestion of the abdominal viscera. The scenery around those places which are reputed for their mineral springs, together with the novelty of the mode of living, is frequently of great use in warding off the despondency which generally accompanies this kind of malady. In selecting a spring, therefore, the feelings of the patient should be consulted, although not always yielded to, for he would often elect seclusion when cheerful society would be better for him. A winter spent in a suitable climate, and the subsequent summer at one of the watering-places, will usually go far to remedy the ordinary defects of the digestive system. This may require to be repeated or not, according to the inveteracy of the disorder; and at all events, it will be needful for the patient to observe great carefulness for a considerable time after his return home, especially if the disease had prevailed for any length of time before change of climate was employed, otherwise he will be almost sure to relapse.

Epilepsy, when it depends upon constitutional causes, when the system generally is below par, and where tonics, cold bathing, nourishing food, fresh air, plenty of out-door exercise, &c., are indicated—especially in young persons of nervous temperament, suffering from perverted secretion and disordered uterine functions—will generally be benefited by a temporary change of residence.

Gout.—Removal to a mild and dry climate is usually followed by an abatement in the frequency of the attacks in this disorder, if not by its removal altogether, where change of climate is resorted to in an early stage of the disease, and when a subsequent adherence to a suitable regimen is rigidly observed. It is not during a paroxysm, nor even when an attack is imminent, that the change can

be made; but simply when the patient is free from active symptoms. Care should be taken, in removing to a warmer climate, to regulate the diet in accordance with the change; and when a permanent cure is hoped for, a mild diet, free from wine of every description, must be enjoined; but in old standing cases, in which an increase in the period intervening between the attacks and a certain modification of the severity of the paroxysms only is looked for, it will not be necessary to cut off entirely the supply of wine, although that which is allowed should be restricted to a good, sound, non-acidulous quality. The south-east of France is usually considered to be the type of climate most serviceable in these cases. Where there is no organic disease, a course of mineral waters may be added to change of air for the relief of gout. The springs of Vichy, Ems, Carlsbad, Aix-la-Chapelle, Wiesbaden, Marienbad, Uriage, Wildbad, Bath, Buxton, &c., are frequently resorted to by persons of gouty disposition.

Hypochondriasis is one of those disorders in which travelling from place to place amongst attractive scenery, and in cheerful society, is of the utmost importance. The exact mode of procedure will depend upon the causes which occasion the malady. The indications to be fulfilled are usually the same as those mentioned in the nervous and atonic varieties of dyspepsia, and, in addition, a sedulous endeavour to combat the effects of real or imaginary distresses which weigh heavily upon the patient's mind. Exciting scenery in a dry and somewhat tonic atmosphere will, in a measure, engage the invalid's attention, who should be warned against the injurious effects of dwelling too much upon supposed grievances. A moderate diet, gentle exercise, a careful attention to the healthy performance of the secretory and excretory functions, bathing and friction, as well as regular hours for sleep, should be enjoined.

A tour through Algeria, where the objects which meet the traveller's gaze on every side are new and interesting, would be of the greatest benefit to a patient so afflicted, provided he were accompanied by a friend of active and cheerful disposition, who would *push on;* for it is rare that this class of patients can be depended upon for the spontaneous carrying out of an active plan of treatment such as would alone contribute to the amelioration of their sad disorder.

Kidneys.—As a prophylactic, change of climate may be successfully employed in several forms of renal disease which may threaten as a consequence of a too close application to business, a deficiency of out-door exercise, a too stimulating diet, or an over-free indulgence in stimulating drinks. A warm and moderately dry climate, by increasing the activity of the skin and lungs, would exercise a beneficial effect in such cases, if aided by a well-regulated diet and judicious regimen.

Liver.—The same may be said of certain hepatic disorders as was mentioned of renal diseases. A warm climate, with a carefully-assorted regimen, will materially aid the effects of pharmacological remedies. The lungs, as well as the skin, act more freely in such a climate, and thus the liver is so far relieved and prepared for the benefit derivable from a course of treatment which might be unavailing at home. Persons who have spent many years in tropical countries would do well to prepare for their return to a cold climate by a winter's residence in a mild region. A course of deobstruent mineral waters may in some instances be resorted to with advantage.

Neuralgia.—Constitutional headaches, tic-douloureux, sciatica, and other neuralgic complaints, are frequently amenable to change of climate. Indeed, many of them

vanish immediately upon very slight changes of residence. The choice of climate will depend upon the individual to be treated; for that variety which would be serviceable in one case might aggravate the symptoms of another person suffering from the same kind of malady. A course of mild thermal mineral waters as those of Ems, Schlangenbad, Buxton, Bath, Plombières, Baden-Baden, &c., and in other cases a course of ferruginous waters, or of those of an alterative and slightly tonic character, is often of great service in neuralgic cases.

Paralysis of a chronic character, where there is no active organic disease, is sometimes relieved by a change to a dry and moderately stimulating climate. With this may be associated a careful administration of thermal mineral baths, as those of Baden-Baden, Wiesbaden, Gastein, Pfeffers, Bath, Buxton, &c.

Phthisis pulmonalis.—Pulmonary consumption is the disease above all others for the treatment of which change of climate has received the greatest amount of credit, associated with an almost equal share of blame. It has cured thousands, and it is not less true that thousands have died under its operation, either from an improper selection of cases or from an ignorant choice of locality. It is not pretended that the climate itself exercises any specific agency in the cure of consumption. On the contrary, there is scarcely any known climate that does not foster its growth and dissemination. It is wide spread throughout all latitudes and under every meridian; but is less destructive in high latitudes than in regions near the equator. It was formerly supposed to be a disease of cold climates especially, and that a change to a very hot climate was the best means of averting or of curing it. We know now that very nearly the opposite of this obtains. Consump-

tion is seldom met with in the Arctic Regions, nor in places under high latitudes, such as Iceland, the Orkneys, or Siberia. Formerly a low level was deemed necessary to the welfare of consumptive patients, but now it is generally believed that places at a considerable elevation are better adapted to their requirements. Such, at least, are the inferences of careful observers who have had opportunities of witnessing the effect of change of climate upon large bodies of men, whether soldiers, sailors, emigrants, or convicts; but it requires a careful consideration of the case, and a very judicious selection of a locality, when it comes to be a question of sending a single individual into a foreign land to seek for the opportunities of regaining his health which were denied to him at home. Military or naval statistics, or even those supplied by emigrants, are not of so much value, as indicative of the sanative influence of certain climates, as might on first consideration be supposed. Soldiers go into foreign lands for a specific purpose, which certainly has not the restoration of health as its basis. They leave home either cheerfully or not, according to their feelings and attachments; when they arrive at their destination, being ignorant of any influence which the change works in the constitution, they eat, drink, and occupy themselves in much the same manner as before they left home; they expose themselves to vicissitudes of temperature; and, in short, as a rule, they are extremely careless of their health. Emigrants, too, go abroad with their minds preoccupied by other thoughts than those pertaining to the general laws of health. They go to seek that which they cannot obtain at home; namely, an adequate remuneration for a certain outlay of physical exertion. They endure privations from food, clothing, and shelter; they labour early, and probably at unseasonable times, and late take

rest. Their health is only valuable to them in proportion as it enables them to continue their daily toil in order to obtain a precarious, and sometimes scanty, sustenance. But with the consumptive invalid, as, indeed, with invalids of every class, the restoration of his health is of the first importance; and in order to effect this by change of climate many little details must be remembered, for it is from the sum of little things that the real benefit is derived.

The symptoms of consumption as observable in the pulmonary system, it should be remembered, cannot be treated by direct local applications; no simple atmospheric condition will relieve them of itself, or it would be unnecessary to leave home at all, since an artificial climate concocted in his own dwelling would, if such were the case, answer all his wants. But it is to the general constitutional deficiencies and to the complications of the disorder that the invalid's attention should be particularly addressed. Exercise in the open air, cheerful scenery, a well-regulated diet, and other regimenal circumstances, are of the utmost importance; and in selecting a situation for a consumptive patient they must be duly weighed.

The complications of the disorder must be first understood before a judicious choice can be made. If, for instance, there be derangement of the digestive organs of an inflammatory kind, a stimulating climate would not be indicated, as might have been the case if the concomitant dyspepsia had been of the atonic variety. The temperament of the patient, too, will influence the choice materially, for it would never be thought advisable to recommend an individual of a nervous inflammatory type to a condition of climate available to one of a leuco-phlegmatic diathesis. Perhaps a few words upon the general objects to be attained by a change of residence in such cases will be sufficient to

direct the reader's attention to a more careful study of the various climates to be described hereafter.

And first of all, in what stages of pulmonary consumption is it that change of climate may be recommended? Much has been written upon the blame which properly attaches to medical practitioners who send patients abroad, as it is said, simply to die. But really no general law can be laid down for the guidance of physicians in this matter, because the cases themselves are so very diverse. In one case a very small infiltration of the lung substance with tuberculous matter will be followed by a rapid development of the disease, whereas in another the same amount of disorganisation might remain almost stationary, or at all events but slightly progressive, perhaps for many months or even years. Or, again, in some cases of chronic consumption, when the disease has even made extensive inroad into the substance of the lungs, it may be still quite competent and advisable to recommend change of climate, for in such cases it often arrests the disorder, and affords the patient an unexpected prolongation of life. So that it is not possible to say, over the whole mass of consumptive patients, where the proper line of demarcation exists between those to whom it is proper to recommend change of climate and those in whom such a procedure would but hasten the consummation of the disease. Perhaps, as a general rule, it would not be well to urge change of climate upon those persons in whom the disease has manifested itself rapidly, in whom, although but little of the lung may be implicated, there is a tendency to inflammatory symptoms upon the slightest provocation, and where the tuberculous deposit rapidly passes from the crude into the softened state.

Mr Keith Johnston, in his valuable observations upon the general distribution of health and disease, forming part of

his colossal work on Physical Geography, has the following remarks on the distribution of pulmonary consumption :—

"Tubercular consumption cannot be said to be a disease peculiar to any one portion of the globe, or to be dependent on climate in any appreciable degree, unless it can be shown that it does not prevail in the excessive climates of the north. It originates in all latitudes from the equator, where the mean temperature is 80°, with slight variations, to the higher portion of the temperate zone, where the mean temperature is 40°, with sudden and violent changes. The opinion long entertained, that it is peculiar to cold and humid climates, is founded in error. Far from this being the case, the tables of mortality of the army and navy of this and other countries, as well as those of the civil population, warrant the conclusion that consumption is more prevalent in tropical than in temperate countries. Consumption is rare in the Arctic regions, in Siberia, Iceland, the Faroe Islands, the Orkneys, Shetland, and Hebrides. And in confirmation of the opinion that it decreases with decrease of temperature, Fuchs shows, from extensive data, that in northern Europe it is most prevalent at the level of the sea, and that it decreases with increase of elevation to a certain point. At Marseilles, on the seaboard, the mortality from this cause is 25 per cent. At Oldenburg, 80 feet above the sea, it is 30 per cent.; at Hamburgh, 48 feet above the sea, it is 23 per cent.; while at Eschwege, 496 feet above the sea, it is only 12; and at Brotterode, 1800 feet above the sea, 0·9 per cent. It is calculated, that in the temperate zone, within which nearly all the civilised inhabitants of the globe are located, at least one-tenth of the population die of this malady. It is uniformly more fatal in cities than in the country: in England the excess in cities is equal to 25 per cent.

The greatest mortality occurs from the age of 15 to 30; taking the sexes together, it destroys one-half of all who die from every kind of disease in Massachusetts between these ages."

Speaking of the effects of elevation upon persons suffering from pulmonary consumption, Dr Archibald Smith (quoted by Dr Copland in his "Dict. Pract. Med.," iii. 1171) says, that "as regards Lima and the coast of Peru generally, the change to the maritime climates of Chili and Ecuador—the first colder, the second warmer—has a decidedly bad effect on the Peruvian phthisical invalid; but the higher elevation on his own mountains of 5000 to 10,000 feet has a decidedly curative influence. In these regions the climate is moderately dry and temperate, favourable to exercise in the open air, and the patient is also removed from a luxurious and sensuous society, as well as from a warm, humid, and relaxing atmosphere. Very possibly the decided benefit received by the natives of Peru from the change from coast to mountain may not be equally shared in by strangers."

Hence it would appear, that in order to derive benefit from change of climate, a consumptive patient must necessarily either turn his steps toward the cold and dreary regions of the north, or ascend to a considerable elevation above the level of the sea; at least such would be his only choice if we are to suppose it essential to his cure that the climate to which he is recommended should be one wherein the disease itself is unknown. But such is not the argument deducible from practical experience. It might be all very well to commend Iceland or Spitzbergen, or the island of Jan Mayen, to a patient suffering from tubercular consumption, if uniformity of temperature were the only desideratum; but then what becomes of his out-door exercise, and the whole train of hygienic prescriptions? How is he

to be occupied during the half year of unchanging snow and ice? To live in a nearly air-tight log cabin, or an unventilated snow-hut, without venturing into the open air, would be not only a terrible but a useless sequence of expatriation; and unless that condition of a prolonged snow winter be attained, there can be no uniformity of temperature.

But it is not necessary to believe that absence of the disease itself from any locality is essential to the treatment of a consumptive patient in it. Experience has placed beyond doubt the knowledge that invalids so afflicted frequently derive much benefit from a change of residence from one place to another, in both of which the disease itself is generated. In recommending change of climate to a consumptive patient, then, the objects to be attained by it should be kept in mind. It is not only as uniform a climate as can be found that is required, but moreover the same means of eradicating the disease as he was possessed of in his own country, but where he was debarred by fitful weather from making use of them. Occupation for his mind and body is essential to the patient's recovery; his object should be to remain as much as possible in the open air, to enjoy a moderate daily exercise for several hours; to partake of a mixed and wholesome nourishing diet; to be refreshed by undisturbed repose during the night; to cleanse his body by daily ablutions; and to have his mind diverted by new and cheerful scenery from home-longings, as well as from dwelling too much upon the nature of his malady. Dr Richardson, in his treatise on the hygienic treatment of pulmonary consumption, gives the following brief summary of the physical elements of a climate likely to prove beneficial as a resort for consumptive invalids: "I shall recommend no particular place as a resort for consumptives; for I wish not to enter into disputation on this point. But I

is the formula of an hypothetical consumptive Atlantis. It should be near the sea-coast, and sheltered from northerly winds; the soil should be dry; the drinking water pure; the mean temperature about 60°, with a range of not more than about 10° or 15° on either side. It is not easy to fix any degree of humidity; but extremes of dryness or of moisture are alike injurious. It is of importance, in selecting a locality, that the scenery should be enticing, so that the patient may be the more encouraged to spend his time out of doors in walking or riding exercise; and a town where the residences are isolated and scattered about, and where drainage and cleanliness are attended to, is much preferable to one where the houses are closely packed, however small its population may be."

A sea voyage is sometimes recommended to invalids in whom the first symptoms of consumption are manifesting themselves. This is frequently followed by a total suspension if not an absolute removal of the disease, in cases where it is judiciously recommended. Short voyages are rarely of any avail; indeed they are often more mischievous than useful. To a delicate person going out to India, a voyage round the Cape is usually of great advantage; but by far the most servicable kind of voyage is one to Australia or New Zealand and back again (round the world). The vessels performing these voyages are almost always well appointed; the society met with on board is generally select and entertaining; but the great advantage to be derived, extrinsic of the voyage itself, is the enjoyment of a perpetual summer, which may be effected by leaving this country about the beginning or middle of October, and returning before the cold weather sets in at the antipodes.

Mineral waters and baths are occasionally recommended in the early stages of phthisis; and some remarks will be

found on their application in this form of disease in the description of several of the much-frequented watering-places. It should be remembered that serious injury is very likely to result from a careless or ignorant self-administration of these remedies, so that it behoves invalids to be very careful not to employ them without competent advice. I do not deem it necessary to mention particularly here any of the places generally recommended as winter resorts for consumptive invalids, as another portion of the work is entirely dedicated to that purpose. And for the same reason I have omitted to mention any rules for dietetic and other regimenal observances, as they will be found, in general terms, in the chapter on *Hygienics*. But both choice of locality and hygienic laws must be made to suit the particular case under treatment.

Chronic Rheumatism is one of the disorders for the alleviation of which change of climate has always enjoyed a certain reputation. A temporary sojourn in a mild climate during the cold months of winter and spring, followed by a well-managed course of mineral waters in the following summer, will usually be found efficacious in the amelioration of the patient's condition, provided always that he is careful to guard against the insidious effects of other concomitant disorders, such as derangement of the digestive or broncho-pulmonary systems. In the first place, the patient should be prepared by a little previous training for the change he is about to undergo; he should be warned against indulging his appetite, which will probably assume an improvement on his arrival in a warm climate, which, however, ought not to be trusted, and by no means to be regarded as a faithful index to the condition of his assimilative powers; he should be recommended to take sufficient stout clothing with him, especially useful flannels; for this

is sometimes neglected, under the erroneous impression that in southern climates winter clothing may be dispensed with. Let him be careful to avoid sudden vicissitudes of temperature, exposure to cold currents of air, and dampness. His residence should be selected in an open, airy, dry and cheerful position, free from neighbouring lakes, ponds, or marshes, and moreover he should pay strict attention to the general laws of *hygiene* as treated of in a previous chapter. The choice of climate should be ruled by the necessity of a mild and equable atmosphere, perhaps rather dry than moist; but the latter qualification will depend upon the general condition of the patient. The dry and somewhat stimulating air of the south-east of France suits one class, whilst the more sedative climates of Rome or Pau are better adapted to another. Algiers offers attractions for invalids of this class, especially to such as can make use of the mineral waters of the country. The natural thermal baths, as those of Bath, Buxton, Wildbad, Gastein, Vichy, Uriage, Wiesbaden, Baden-Baden, &c., are the variety chiefly recommended in this disease; but both change of climate and the choice of a mineral spring must be dictated by the peculiarities of the case to be treated.

Rachitis may be benefited by change of air when the atmosphere in which the sufferer dwells is rendered impure by any incontrovertible cause, or is too relaxing. Pure air, a full clear sunlight, nourishing food, and other hygienic means, associated with proper medical treatment, should be enforced when circumstances permit.

Scrofula.—Change of climate may be resorted to with infinite advantage as a prophylactic against the development of the strumous cachexia in children predisposed to it by hereditary transmission; and it may likewise with benefit be applied to the relief of persons in whom the

disease has manifested itself. A clear, dry, but mild atmosphere, is indicated in such cases, with a careful attention to those rules of hygiene which have been summed up in a previous chapter. Sea-bathing, and likewise a careful use of mineral waters, especially of the muriated-saline variety, are most useful when judiciously selected according to the peculiarities of the case.

Surgical Diseases.—There are several kinds of lesions, usually of the extremities, which having passed from a recent into a chronic condition, frequently require for their removal, either a change of climate, it may be from one of an irritating character to one of a more sedative type, or *vice versa;* and probably, in addition to this, the prolonged application of one or other of the varieties of mineral-baths. Sprains, unreduced luxations, spurious anchylosis, chronic cicatrices of wounds, especially of the gunshot variety, diseases of the bones, and various kinds of ulcers, are so many of these. The natural thermal springs are usually resorted to for the cure of such disorders; but patients should be reminded that considerable danger attaches to such a course of treatment, and that it should on no account be undertaken except under the immediate guidance of a competent medical adviser.

CHAPTER V.

ALGERIA.

It is difficult to realise the primeval artlessness which attached to the original inhabitants of this country, since we are compelled to regard it through the long vista of a history darkened at intervals by atrocities which have steeped its memory in imperishable infamy. And yet Algeria must have been a country fair to look upon when the measure of her people's existence was fully occupied with pastoral offices; when they received directly at the hands of the Creator those necessaries of life which, by a bounteous providence, He was ever ready to supply; and when their innocent mirth was unalloyed by the gratification of those baser passions which subsequently overwhelmed them in deeds of deepest guilt. And even now, shorn as she has been of her pristine purity, the land is still fair to behold, and presents to the modern traveller a scene of surpassing interest, as he witnesses her gradual emancipation from the darkness and thraldom of a nescient superstition to the sunshine and freedom of a growing civilisation.

Few countries own a history more replete with thrilling narrative than those of Carthage, Numidia, Mauritania, and Gœtulia, constituents of ancient Barbary; and nothing that I am aware of can contribute more materially to enhance

the pleasure of a winter's sojourn in Algeria than a previous well-grounded knowledge in the customs and manners of its former inhabitants.

It is sufficient for me to remind the reader here, that from scenes of rapine and bloodshed the Algerine has at length emerged a sadder but a wiser man: that at length the wily corsair has been taught to seek in honest labour the elements of an independence which may bring honour to his frosted brow; and that at length the crescent, last emblem of a cruel despotism and infidelity, has been superseded by the cross, leaving Christianity to pour the wine and oil of mercy and peace into the wounded consciences of those at whose hands she had so long suffered a ruthless persecution. Since 1830, the tricolor of France has waved loftily over the minarets of the Prophet, and it is much to be hoped that no mere sectarian enthusiasm will be permitted to straighten the doorway thus opened to Christian enterprise, but that, by a mild forbearance from party zeal, and a common desire for the best interests of the people, the temporal dominion which now rests upon the country may be rendered both wholesome and regenerative.

Algeria extends between the 32d and 37th parallels of north latitude, and from 2° 11′ W. to 8° 53′ E. longitude. On the west it is bounded by Morocco, on the east by Tunis; on the north its shores are laved by the waters of the Mediterranean, whilst its irregular southern outline is swept by the sabulous wastes of the Great Desert. Thus situated, the country is traversed by two isothermal lines, corresponding respectively to a mean annual temperature of 64° and 68°. Its northern aspect generally is not less than 2° lower in latitude than the south of Spain, Italy, and the Grecian Archipelago, but it extends upwards of 3° to the north of Egypt. The coast-line, extending from Morocco

on the one hand to Tunis on the other, presents in its trending a series of anfractuosities which have the effect not only of increasing the extent of seaboard, but likewise, in many situations, of investing its natural scenery with additional attractions, and its climate with mildness and equability.

The Atlas Mountains, which range throughout the country at an elevation in some points exceeding 7000 feet, contribute a picturesque grandeur to the general scenery. They constitute, especially in their intricate ramifications between Algiers and Constantine, the fastnesses of the Kabyle race, a people who, although apparently subdued by the presence of French bayonets, are endowed, nevertheless, with a latent independence peculiar to their highland character, and of which they will not readily be divested.

Algeria is divided into two distinct regions by an imaginary line running from west to east, somewhere about the 35th degree of north latitude. The region lying to the north of this line, between it and the Mediterranean, is called the TELL; that stretching towards the south, contained between the supposed line and the southern boundary of the French possessions, answers to the name of Sahara. The territory altogether occupies an area of upwards of one hundred and fifty thousand square miles, of which the Tell occupies nearly one hundred and thirty-eight thousand. The TELL is strictly the country of agricultural produce, and consists of rich valleys, as well as of wide-spread fertile plains. It yields luxuriant crops of wheat, barley, maize, millet, rice, and legumes, together with other productions of minor importance. It is a well-watered country, and although it can scarcely lay claim to the title of a well-wooded region, still it is not by any means destitute of forests, which furnish, amongst others, magnificent specimens of oak,

olive, cedar, elm, almond, pine, and cork trees. In the gardens may likewise be seen promegranate, mastic, lote, plum, fig, and apricot trees, together with the myrtle, the carouba, and an occasional palm.

The maritime regions of Algeria, however, are usually denuded of their arborescent productions from two causes: first, by reason of the practice of incendiarism, which is resorted to by the indigenous husbandman as the only means of fertilising and clearing his land, for the ashes of the burned herbs and brushwood are all the guano he can command; and secondly, in consequence of the grazing of horned cattle, whereby the young plants are destroyed. But in the neighbourhood of Algiers, this calamity, for so it must be considered, is alleviated by the numerous gardens which surround it.

The SAHARA is not a cultivable land, but in its turn affords abundant pasturage, and yields large crops of fruit. In the *Sersous* especially the pasturage is remarkably fine, and feeds immense flocks of sheep belonging to the nomadic tribes. The oases are the gardens of the Sahara, and are productive of vast quantities of date-palms, besides vines, peaches, and other fruits, previously mentioned as growing in the gardens of the Tell. The Sahara is divisible into two aspects, the one directed towards the north, consisting of the gradually ascending pastoral districts, which are well watered, and more thickly inhabited; the other directed towards the south, sloping gradually down to, and partaking of more of the characteristics of, the Great Desert. In the latter division exists a rich archipelago of oases, which extend at irregular intervals to the southern extremity of the French territory.

Algeria is watered by many rivers, some of which attain, in certain seasons, a considerable magnitude. Usually,

however, they bear the character of mountain torrents rather than of regular streams, disappearing altogether in summer and returning with renewed fury after the rainy season. Of these the chief are, the Shellif, the Habra, the Tafna, and the Seybouse. During the rainy seasons of autumn and winter, the rivers assume a tremendous magnitude, and having at their outlets, in certain instances, a lower level than the sea into which they tend to debouch, instead of making their escape freely they overflow their banks, and convert the neighbouring plains into noisome marshes. Near Bona this circumstance has been the cause of much sickness, and particularly in the season of 1852-53, when the epidemic of fever arising therefrom was most deplorable. The marshes of the *Regaïa* and Lake Halloula, on the east and west sides of the Metidja, near Algiers, owe their origin to the same cause. But it is to be hoped that the sanitary measures which have hitherto been so vigorously carried on, to the effectual remedy of some of these evils, will not cease until such morbific agencies are entirely eradicated. Besides the rivers there are many lakes in Algeria, most of which contain salt water, and are dry in summer; one or two contain fresh water, as that of *La Calle*, and others contain salt water, but do not disappear in summer. Of the latter class may be mentioned that of Fetzara, near Bona, which is remarkable not more on account of its extent than for the quantity of fish and sea-fowl which inhabit it. Most of the river and lake water of Algeria is more or less charged with saline matter, and in some of it this is the case to such an extent as to afford, by incrustation along the margins, not only a sufficient supply for the domestic requirements of the neighbouring inhabitants, but even, in some instances, enough to render it a valuable article of commerce.

The mountains of Algeria traverse it in a direction from west to east, having their origin in the empire of Marocco and their termination in the kingdom of Tunis. They consist, in general terms, of two chains, which run more or less parallel with each other in mid course, but form in many situations a network so intricate as to defy arrangement, at least by ordinary skill. It is towards the eastern boundary of the territory that this orological difficulty manifests itself more distinctly, whilst towards the western extremity the local accidents are of a much simpler kind. The southernmost chain, or *Great Atlas*, is common to the Sahara as well as the Tell, and occupies a position chiefly in what may be called the *Debateable Land*. The northernmost, or *Little Atlas*, diverges from the former into a course leading towards the coast, subdividing the intervening country into valleys and plains of irregular extent and configuration. Between these two lofty transverse chains of mountains are many longitudinal ridges, dividing the uplands into separate valleys, in the same manner as the spurs proceeding from the Lesser Atlas towards the sea divide the lower maritime districts.

The soil of the latter districts consists chiefly of a compound of sand and marl, together with calcareous rocks, belonging probably to the Jurassic order, resting upon a thick bed of marl. The formation of the Lesser Atlas seems to consist principally of calcareous grit, whilst the valleys and plains extending towards the sea are mostly sabulous. Almost everywhere the soil is impregnated with salt, together with a considerable quantity of saltpetre.

The constitution of the range of the *Sahel*, on the northern slope of which the town of Algiers itself stands, is made up, according to Wagner, of a covering of alluvial soil whence protrude rocks also of the tertiary lime formation, resting upon talcose mica-schist, which forms a prominent feature

in the geology of the neighbourhood of Algiers. At the upper part of the range this merges into feldspar and gneiss. Here and there, too, it shows traces of iron in different forms, but in quantities not worth working. In several other parts of the French territory there are mines of iron, copper, and lead, which, however, do not appear to be greatly appreciated. In the *Bou Hamra* mountains the iron mines are very rich, and seem to have been worked at some remote period; probably by the Romans.

In addition to the transverse division into Tell and Sahara already dwelt upon, the territory of Algeria is moreover divided into three distinct provinces, of which that of Oran lies to the west, that of Algiers in the centre, and that of Constantine towards the east. The vice-regal government of the colony is essentially military, each province being under the control of an officer of high rank, at the head of whom is the governor-general, usually a marshal of France, whose head-quarters are in the town of Algiers.

Although, in strict conformity with the scheme of this work, it would be improper for me to digress from the subject immediately under consideration,—that of change of climate as a remedial agent,—yet there are, I conceive, some few points of interest which may with propriety be brought before the reader in such a manner as a cursory review of the three provinces will permit. In following this rambling discourse, I shall endeavour to dwell more particularly upon the medical features which present themselves, and especially upon the consideration of the various mineral springs which occur throughout the country. And in anticipation, let me just briefly mention, that almost all the waters which in the present day are in vogue amongst the French, enjoyed in former times no small reputation with the autochthons of the land. It is, indeed, chiefly to the

legends narrated by the latter that the Franks owe that spirit of research which led them to investigate these matters so minutely as they have done. There are in many places, too, distinct vestiges of ancient Roman baths which clearly indicate the value at which these springs were estimated in their time. Of these, the ruins of *Hammam Berda*, between Bona and Constantine, which still preserve the name of the *Sacred Grove*, as well as others in the neighbourhood of *Cherchell*, are well marked relics.

The word *Hammam* is applied by the Arabs to mineral baths of all kinds, and is followed by a distinguishing affix, as in the instances of *Hammam Melouane*, *Hammam Meskhoutin*, &c. Of the mineral waters, some are cold at their source, whilst others rise at a temperature too hot for immediate use; the former are of the ferruginous class, the latter chiefly sulphurous and saline. In addition to these, there are many springs whose therapeutic reputation rests simply upon the saline impregnation so common throughout the country. I shall have occasion to refer to the medicinal qualifications of these waters when speaking hereafter of particular springs.

ORAN is the westernmost division of the French colony. It has been hitherto less frequently visited by ordinary excursionists than the other departments, and has been less obtruded upon the notice of the physician as a commendable winter resort. The town of Oran itself is prettily situated at the most receding point of a deep bay or gulf formed by the Mediterranean at a point corresponding very nearly with the meridian of Greenwich. It rests upon the eastern aspect of a mountain declivity on the opposite margins of the *Oued-el-Rahhi*, whose waters irrigate the surrounding gardens. Oran has frequent communication with the south of France, and occasionally, by steamboats,

[illegible], a port under protection of
tremity of the bay, is employed as the ha
traffic. Oran is the second town of impor
and is so rendered by reason of its proxi
and Spain, with both of which countries it
on important commercial transactions.

The thermal springs of Oran, known b
Bains de la Reine d'Espagne, have their sou
board at a distance of about three miles to t
town. They emerge from the side of a m
slopes gradually down to the Mediterranean,
not more than ten or twelve feet above the s
water issues by means of four separate s
together yield a quantity equal to about fift
minute. It is a transparent, limpid, inodorous
a slightly brackish and somewhat acid taste,
gravity slightly above that of distilled wate
perature of the cave from which they flow r
89·60°; but the water itself, when obtained a
of its emergence from the rock has a tempera
114° or 116°. According to an analysis made b
a thousand parts of water yield the followi
stituents:—

Chloride of [illegible]:—

in consequence of the absence of sulphur as an element in their constitution, they are totally inefficacious in the form of baths, in any chronic diseases of the skin, having the form of psoriasis or herpes; but that if administered internally in such cases, as simple adjuncts to specific remedies, they may be productive of good effects. On the contrary, in cases of chronic rheumatism, chronic arthritis, and in certain neuralgic affections, and even in gout, he believes them to constitute an efficacious remedy. In consequence of the laxative tendency of the predominating salts, the waters are likewise recommended in what may be termed the *Cachexia Oranensis*, a form of malady characterised by chronic engorgement of the abdominal viscera, especially of the mesenteric glands of the liver, spleen, &c. In addition to these disorders, the waters have proved highly beneficial in chronic diarrhœa and dysentery, and were much employed by the French troops when the latter disease raged as an epidemic amongst them at various times during the first ten years of their settlement in Algeria.

The climate of Oran is understood to be mild and equable in winter, but oppressively hot in summer; I have, however, been able to obtain but few reliable data to judge from, and my own experience is not sufficient to enable me to state decisively its sanative capabilities. The following figures represent the mean annual, seasonal, and mensual temperature, as observed during two years :—Year, 63·42. Winter, 51·89; spring, 61·11; summer, 74·85; autumn, 65·84. January, 49·17; February, 55·13; March 55·22; April, 61·21; May, 66·90; June, 74·59; July, 74·41; August, 75·54; September, 72·77; October, 66·70; November, 58·06; December, 51·37.

The scenery around Oran is of an engaging description, and the accommodation for strangers in the town, although

fortune, which in 1850 was no
ascribed to the filthy habits of th
a condition not unfrequently of
In 1849 cholera raged in the prov
and was imported thence into A
along the coast, which were visited
ment steamers after leaving Oran;
which she passed without entering,
demic until a month later, when it
overland by way of St Denis. In th
malady again made its appearance a
extend to Algiers; and again in 1851
in the former place, in which the latt
Oran, however, must not on this acc
healthy; for it has during a long pre
a notability for its salubrity, and no d
would be easily reclaimable at the e
exercise of sanitary regulations.

CONSTANTINE.—The province of Co
east of that of Algiers, between it and t
The chief town, of the same name, is s
rock, at a considerable elevation, an
on all sides by a deep ravine

scarcely be called a port, at the extreme west of the bay), whence he has travelled round the bay to Philipville, a distance of little more than two miles; or that he has crossed the bay in a small boat conducted by Maltese sailors, which is perhaps the less pleasant method of accomplishing the journey.

The town of Philipville is situated on the shores of a deep bay into which the waters of the Mediterranean extend themselves, adding to the general aspect a soft tranquility peculiar to their usually placid surface. The town is one entirely of French origin, and dates no further back than 1838, when it was constructed by Marshal Vallée on the site of an ancient Roman port. Previously the maritime relations with the interior had been conducted by means of a prolonged route from Bona; and it was simply to make the communication more direct that Philipville was erected. The town is clean, and the hotels are well conducted and respectable. Of the *Hotel de France,* I find I have recorded that the accommodation was good, and the landlord an exceedingly civil and obliging man. He materially facilitated my plans for seeing the town and neighbourhood, concerning which he displayed a more than ordinary amount of intelligence. The *banlieues* of Philipville are exceedingly pretty, and contain Roman antiquities of considerable interest. The walks in the neighbourhood are well wooded and sheltered from cold winds. The great drawback to the place is the want of a safe harbour, for even the sheltered position of Stora is no protection for steamers and other vessels in tempestuous weather.

Before proceeding to Constantine, let me ask the reader to accompany me to *Bona,* an ancient Arab town, but now almost entirely appropriated by French houses. It is

in ancient Carthagenian and Roman associations. Bona is situated on a bay of the Mediterranean, at a distance of 85 miles to the north-east of Constantine, and is watered by the river *Scybouse*. Its exact geographical position is 36° 53′ 58″ N. lat., and 7° 46′ 5″ E. lon. The town is strongly fortified and surrounded by a lofty wall. It has frequent communication with the south of France by means of the steamboats plying between Marseilles and Tunis; and occasionally there are steamers along the coast to Algiers and Oran, and *vice versa*. The plain around Bona, as has been already mentioned, is low, sabulous, and marshy, and has on frequent occasions given rise to epidemic fevers of a very destructive character. Otherwise its locality is well suited for a winter resort, the more so on account of its proximity to the mineral waters of *Hammam Meskhoutin*. During my visit to Bona there was an encampment of lion-hunters, chiefly English, who had gone out to meet Jules Gerard for the purpose of hunting in the neighbourhood of Guelma. In all the places which I visited on the coast of Algeria, and especially at Dellys, Bougie, Djidjelli, Philipville, and Bona, I encountered the melancholy effects of earthquakes. Houses riven in two, others razed to the ground; walls split through or hurled over; from the effects of which, however, the inhabitants appear to have had most marvellous escapes. The mean temperature of the year, seasons, and months, at Bona, is represented with tolerable accuracy by the following figures:— Year, 71·17. Winter, 57·80; spring, 67·52; summer, 85·16; autumn, 74·18. Jan., 52·16; Feb., 60·44; March, 62·06; April, 65·30; May, 75·20; June, 83·12; July, 86·18; August, 86·18; Sept., 79·88; Oct., 79·34; Nov., 63·32; Dec., 60·80.

Not far distant from Bona occur the baths of *Hammam Meskhoutin*, a term which bears many translations, of which

the *enchanted baths*, the *confounded baths, baths of the condemned*, &c., are so many. Of all the mineral baths in Algeria, these are the most remarkable for their extremely high temperature, their medicinal influence, and, moreover, on account of the scenery which surrounds them. These waters have their origin in a supposed quadrangle, formed by imaginary lines drawn so as to connect the towns of Constantine, Philipville, Bona, and Guelma; they are nearer the latter than the three former of these places, from which they are about equidistant. The route from Bona to Hammam Meskhoutin traverses the lofty Atlas chain in a line parallel to that which in ancient times connected the Roman towns of Hippo-regius (Bona) and Cirta (Constantine), and ascends the rich valley of the Seybouse, which extends from the town of Guelma to *Mjez-Amar*. From Guelma the road to the baths takes along the right bank of the Seybouse for a distance of seven or eight miles, where the river is crossed, and then it becomes common to that from Constantine near *Mjez-Amar*. From this point two roads conduct to the baths, one of which crosses the river *Bou-Hamdan* almost immediately, a little above the position where it joins the river *Scherf* to form the *Seybouse*, and is adapted to the passage of vehicles; the other, available only to horsemen and pedestrians, ascends the left bank of the *Bou-Hamdan* through a wood, crosses the river, and subsequently joins the former a short way before arriving at the springs. In approaching from Philipville, the route lies through *Jemappe*, whence a carriage road, passable in good weather, conducts the traveller to the banks of the *Seybouse*, where he falls in with the Bona and Constantine roads between Guelma and *Mjez-Amar*.

The thermal springs of *Hammam Meskhoutin* occupy a nook endowed with nature's choicest gifts; a rich and varied

arborescent vegetation blooming over a prolific soil, and confined by rocks, the peculiar formation of the thermal springs. Amongst the trees which adorn the locality may be enumerated the olive, mastic, oleander, and vine, in the midst of which the fervent waters leap forth from the surface of the earth, and with an angry roar dash down in magnificent cascades. In their course they sweep over an extensive bed of variegated stalagmites, and finally exhaust themselves in an exquisitely wooded dell beneath, where they mingle their foaming volumes with the cooler waters of the *Chedakra*, a streamlet which subsequently falls into the waters of the *Bou-Hamdan*. During their emission and subsequent course, the waters fill the surrounding air with curling steam, which at a distance marks their position as the wreathing smoke of a chimney points out a remote habitation. The neighbourhood is watered by numerous rivers. The valley in which the waters have their origin is surrounded by a series of mountains rising gradually from 3,000 to 4,000 feet above the level of the sea. The chief of these are the *Djebel-Deback*, barren, and situated to the north, and the *Djebel-Mtaia*, to the north-west, in which latter occurs the deep cave of *Dhamous-Djemda*, where the Christians are supposed to have hid themselves from the cruelties exercised upon them by the Vandals. The situation of *Hamman Meskhoutin* gives to its climate a coolness which in winter is sometimes rather severe; but upon the whole, it is mild and tolerably equable. In summer the heat is (especially from July to September) excessive, and when the sirocco is blowing, the atmosphere is most oppressive. Fortunately this does not continue long at a time,—seldom more than a few hours, and never beyond three days. At other times a cool refreshing breeze usually sets in about ten in the morning, and blows all day. The heavy

rains commence in October, and continue more or less until April: they are invariably introduced by a strong *north-wester*. Vegetation flourishes throughout the winter months. The temperature of the waters is maintained uniformly throughout the year at the remarkable height of 203°, which is much higher than that of any European thermal spring. They emit a large quantity of gas on making their escape, which, from an analysis by M. Tripier, appears to consist of the following ingredients :—

Carbonic acid gas, ...	97·0
Sulphuretted hydrogen, ...	00·5
Azote, ...	02·5
	100

whilst an examination of forty ounces of the water itself, by M. Tripier, yielded the following results :—Chloride of sodium, 6·416 ; chloride of magnesium, 1·203 ; chloride of potassium, 0·283 ; chloride of calcium, 0·167 ; anhydrous sulphate of lime, 5·879 ; sulphate of soda, 2·724 ; sulphate of magnesia, 0·103 ; carbonate of lime, 3·970 ; carbonate of magnesia, 0·653 ; carbonate of strontia, 0·023 ; metallic arsenic, 0·007 ; silica, 1·080 ; organic matter, about 0·976 ; fluorine, a trace ; oxide of iron, a trace ; total, 23·477 grains.

Besides these springs, however, there are others marked by characteristics differing from the above. Leaving the Cascade by the footpath leading to the valley towards the south, and again ascending the course of the Chedakra, the traveller meets at the distance of about a mile with springs of a totally different character. These yield a smaller deposit of calcareous matter, are of a brick-red colour (caused by the presence of protoxide of iron), have an uniform temperature of 172·40°, and do not emit a sulphurous odour. They have a slightly styptic taste, and are limpid

colourless at their emergence from the ground, but subsequently, in their passage along the streams below, deposit an ochry-calcareous sediment. The chief of these ferruginous springs is capable of yielding nearly two thousand gallons per hour. According to an analysis by M. Fegueux and M. Moreau, forty ounces of the water taken from the chief spring give the following results :—Carbonate of magnesia, 0·365; carbonate of lime, 2·695; sulphate of lime, 6·625; sulphate of soda, 0·815; chloride of potassium, 0·626; chloride of sodium, 5·409; chloride of magnesium, 1·108; phosphate of soda, 0·311; oxide of iron, 0·771; silicic acid, 0·192; iodine, traces; organic matter and loss, 0·126; total, 19·043 grains.

Of the therapeutic effects of these waters, especially those first mentioned, we have a *résumé* in the report of the Council of Military Hygiene which was directed to inquire into this matter in 1857. The result of their investigations was given in the following terms :—

1. Cases in which the waters may be prescribed with advantage:—

a. Aching pains; stiffness of the joints; muscular contractions; false anchylosis, the result of injury; sprains, dislocations, and other external injuries.

b. Chronic rheumatism, muscular and arthritic.

c. Engorgement of the abdominal viscera; dropsies of a passive nature; sequelæ of intermittent fever.

d. Old wounds, complicated with injury of bones, or with the extrusion of portions of the osseous structure.

e. Flabby and fistulous ulcers, with caries or necrosis of the bones.

f. Chronic cutaneous affections, herpetic and others.

2. Cases in which the waters are injurious :—
   a. Active superficial and inflammatory diseases of the skin.
   b. All diseases in which intermittent fever is actually present, or with which it is complicated.

In the vicinity of these baths may still be seen vestiges of Roman architecture; and it is generally believed that the same waters, under the name of *Aquæ Tibilitanæ*, were held in high esteem by the Romans in their day, as they assuredly are at the present time by the native population of the district, who hold many curious traditions of the marvellous cures wrought by them upon their ancestors. Hammam Meskhoutin is regarded as an important military sanitarium, and I have no doubt it will, in course of time, receive that attention in the way of providing efficient accommodation which is at present by no means commensurate with its sanative reputation.

CONSTANTINE, the *Cirta* of the Romans and *Cossentina* of the Arabs, is situated upon a lofty plateau of trapezoidal form whose four corners correspond with the cardinal points. The rock upon which the town is built is separated from the adjacent heights of *Mansourah* and *Sidi-Merid* by means of a narrow but very deep cleft, in the bed of which flows the river *Roumel* in its passage from the upper valley into the plain of *Milah*, into which it debouches in the form of a magnificent cascade.

Constantine lies in lat. 36° 22′ 21″ N., and long. 6° 37′ E.; and at an elevation of very nearly two thousand feet above the level of the sea. In its relations with the surrounding country it is not very much unlike Edinburgh Castle, except that in the greater part of its circumference, although fully detached, it still remains close to the heights from which it is separated; like it, too, it maintains its peninsular char-

acter by means of a gradually depending ridge which connects, it through a long zigzag route, with the plain below.

There is no place in Algeria in which the traveller can in a shorter time become acquainted with the manners and customs of the natives than in Constantine. I became more intimate with them during the few weeks I spent in that curious town, under the guidance of the zealous and amiable minister of the Jewish Missionary Society, the Rev. Mr Ginsburg, than during a winter's sojourn in Algiers. Perhaps this is partly owing to the circumstance of the inhabitants of Constantine meeting with fewer strangers, and on that account being more free to receive them; be that as it may, they certainly entertained me most hospitably, and gratified my curiosity to the fullest extent. As a resort for invalids, however, Constantine does not, I presume, contend with the lower and maritime districts. It is often excessively cold, and the daily range of temperature is sometimes very extensive. The surrounding country, too, is barren, and presents but few attractions. The mean annual, seasonal, and mensual temperature is as follows:— Year, 62·95. Winter, 50·36; spring, 54·08; summer, 79·82; autumn, 67·52. January, 51·26; February, 49·46; March, 45·14; April, 51·26; May, 65·84; June, 76·46; July, 83·30; August, 79·70; September, 76·28; October, 65·84; November, 60·44; December, 50·36.

From Constantine, as from other parts of Algeria, agreeable excursions may be undertaken into the interior; or, what is sometimes done by persons in robust health, a tour may be made from one province to another by way of the southern extremity of the Tell, skirting and visiting certain of the oases of the Sahara. If the accommodation in this district were better, I am of opinion that certain localities near the desert might be fixed upon as excellent winter

quarters. I can conceive of nothing more enjoyable than a sojourn of four or five months in one of the delightful oases which stud the southern declivity of the Sahara; provided always that the party be able to afford of itself the intrinsic essentials of social enjoyment. And I may here add, that travelling everywhere throughout the country is perfectly safe, and that I always met with civility and the most friendly hospitality at the hands of the natives.

There are vehicles several times a week from Constantine to the interior; but I would strongly recommend a party so journeying to provide themselves with horses, which they can do at a reasonable expense, and with much greater convenience to themselves. They would then do well to avoid diligences, in order that they may have as much accommodation at the caravanserails as they require, which they cannot always obtain when in promiscuous company. In such case, if time permitted, it would be better to give notice by the previous diligence of their coming; so that an adequate supply of *nourriture* may await them. I am supposing the party to consist partly of ladies or convalescents of either sex who cannot bear over-fatigue nor much inconvenience. Of course, they who can *rough it*, need take fewer precautions. Sometimes travellers of the latter class find it convenient to purchase horses in one of the large towns, say Algiers, and then, having made use of them in their route to Constantine, or elsewhere, to sell them again at a trifling loss; the difference between the buying and selling price being seldom beyond, and frequently not so much as would have been the cost of hiring horses for the journey. In excursions of this kind, travellers may find it necessary to procure from the military authorities a Spahis escort, besides taking a native servant to wait upon them.

Before concluding these remarks let me rapidly accompany the reader in an excursion to Biskra, whence he may proceed to any of the neighbouring oases at his pleasure. There is but little to entertain the traveller during the first part of the journey; the country is barren and dreary, and it is not until the end of the second day's travelling (the distance may be accomplished in one, but it is very fatiguing), that he finds himself in tolerably comfortable quarters in the town of *Bathna*. The first night may be spent either at *Mlilah*, at *Aïnyagout*, or at either of the intervening houses named respectively, the "*Maison Bourbier*," and the "*Hotel des deux Lacs Salès*," the latter of which is about half-way between Constantine and Bathna.

After a night's rest at Bathna, perhaps at the *Hotel de France*, we spend the next day in examining the Roman relics at the village of *Lambessa*, situated about half-an-hour's ride from Bathna. The first feature that strikes the visitor to the ancient town of *Lambœsis* is a melancholy one; it is that of a massive building, containing strongly-built cells, to the number of 446, for the reception of the refractory subjects of the Emperor of France. Of these, when I visited the building, 317 were occupied. The Government provides nothing for the comfort of these people beyond the bare walls of their narrow dwellings, an iron bedstead and bedding, a narrow shelf, a small table, and washing apparatus, and yet some of the cells were most profusely decorated with ornaments made from pieces of stone from the neighbouring ruins, from bones, pieces of wood, &c., and fashioned according to the genius of their several occupants. Some of the rustic scenes made up of moss, carved stones, and wood, were exquisitely constructed; others decorated their walls with crayon sketches of no mean order. Their food is plain, but good of its kind. In a large apartment,

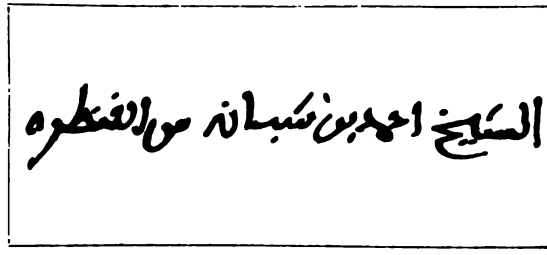
fitted up for the purpose, the prisoners are permitted to exercise their skill in handicrafts of various kinds, the results of which they are allowed to sell to the scanty visitors, and the profit accruing therefrom is kept for them by the authorities until they are liberated, or used (according to the discretion of those in authority over them) to supply their present limited necessities, or rather, perhaps I should say, luxuries. These men are not common criminals, as we see at a glance, from their noble bearing; the head and front of their offending is that they would not (in their own terms) "acknowledge Mr Bonaparte." The ruins at Lambessa have been greatly abused by the French for building purposes. The prætorium is still in good preservation, and is used as the repository of statuary and other relics met with during the excavations in the neighbourhood. The best remnant of the fine arts still *in situ* is an exquisite piece of Mosaic pavement in front of the *Penitentiary*, constituting an allegorical representation of the seasons, the colours of which are probably almost as vivid as ever they were. Another day may be spent in visiting a handsome cedar forest in the neighbourhood of Bathna.

I should caution the reader against the wide range of temperature experienced here; I suffered very much from it. M. Fournel, a mining engineer, who bivouacked upon the plateau of Bathna, records the following remarkable range of temperature, as witnessed on the 16th March 1845; the minimum of the night was 21·20°, and the maximum of the day 91·40°, showing a daily range of 70·20°. This is the highest point of the plateau hereabouts; and in journeying southward we shall find the watercourse is changed, running with us, and no longer meeting us as heretofore.

By leaving Bathna about a couple of hours before break-

fast or luncheon, we shall reach the caravanserail of *El-Ksour* in time for either of these meals; whence, by travelling over a rugged road, which crosses the bed of the *Oued-Kantara* several times, we shall arrive at *El-Kantara* ("the Bridge") in about four hours more. The passage across the old Roman bridge into the strait which leads from the dry and barren plain previously crossed to the delightful oasis of *El-Kantara*, is one of the most fascinating scenes I ever encountered, and is well worthy of a visit.

We shall not be very long in the caravanserail here before we receive a visit from the hospitable chief magistrate of the Arab settlement. He is most affable and courteous, and will spare no exertion in showing us his gardens of waving palms, his horse, and all that he holds valuable or curious; though he may not have an opportunity of introducing us to the festivities of an Arab marriage, as he did when I visited him before. He will probably introduce himself, as on previous occasions, by leaving his *carte de visite*, a *fac simile* of which I beg to offer for the reader's advantage. It is copied from the one presented to me, and sets forth that the visitor is *El Shaïkh Ahmid ben Shaban min el Kantara*, or, in other words, The Sheik Ahmid the son of Shaban of Kantara.



Having exhausted the lions of El Kantara, we leave

this favoured spot early next morning and commence a journey over a country which introduces us into something like desert soil, or rather rocky sand, but not yet quite destitute of tufts of grass and straggling bushes, although it presents nothing that can be worthy of the name of pasturage. In rather less than three hours we arrive at the pretty little oasis—a green patch merely—and caravanserail of *El-ou-Taïa*, near which is a small Arab settlement of mud houses overlooked by a picturesque and not very spacious mosque. Two hours after leaving this we encounter the southernmost slopes of the Atlas range, and having mounted the *Col-de-Sfa*, we behold from this moderate elevation the vast expanse of desert before us, and but a little way from the foot of the mountain, within the surge, so to speak, of the sea of sand, lies the oasis of *Biskra*. Twenty minutes more brings us into the town of Biskra, whence the oases of *Sidi Okba*, of *Zaatcha*, and as many others as suits the convenience of the traveller, down to that of *Ouregla*, on the southern boundary of the French possessions, may be visited. And here I must take leave of my fellow-passengers and pass on to other places and subjects to which this work is more properly dedicated. Had I been called upon to write a guide-book, there are thousands of most interesting circumstances connected with the history, scenery, and topography of the country, which ought to have been mentioned, but which in this hasty sketch I have passed over in silence. I venture to remark, in conclusion, that notwithstanding the number of excellent books which have been written on Algeria, a good "Murray's Handbook" is still a desideratum.

CHAPTER VI.

ALGIERS.

BEFORE the invalid sets out for his winter quarters, whether in Algiers or elsewhere, let him be careful to provide himself with apparel suited to the season he is about to encounter. If he be going to Algiers, it may be that the first trans-Mediterranean sight that meets his gaze may be the snow-clad heights of one or other of the lofty mountains of the Atlas range; but it will be too late then to regret the absence of the comfortable overcoat, or the warm shawl, or the strong boots that were left at home under the impression that he was hastening to a climate where all these things were unknown and useless. There are cold days in Algiers, and there are wet, very wet, days in Algiers, and the invalid must be prepared for them, otherwise change of climate will be of no avail. I do not place these remarks in the front rank, with a view of perplexing the physician, or of terrifying the invalid; but simply in order to avert a very common danger which I have seen operating on more than one occasion equally to the injury of the patient's health and the climate's character. There are very few places of ordinary winter resort which are not open to the same suggestions, and I only think it necessary to adduce

them here, because some persons have an idea that in Africa surely these trifling matters may be neglected.

Algiers is not by any means difficult of access, nor is it an expensive place to reach, when compared with many others at scarcely so great a distance. The time required by an invalid to make the journey may be estimated perhaps as follows:—A day from London to Paris, and a day of rest; a day from Paris to Lyons, and a day of rest; a day from Lyons to Marseilles, and finally, two days upon the Mediterranean. Thus by leaving London on Thursday morning, resting in Paris on Friday, travelling to Lyons on Saturday, resting there on Sunday, and proceeding to Marseilles on Monday, the invalid traveller would be at that port in time to cross the water by Tuesday's steamboat, which would bring him to the end of his journey at about mid-day on Thursday, or eight days from the time of his departure. By leaving out the days of rest, which I do not recommend, he could of course shorten the time by so much. The expense of travelling from London to Algiers by first-class conveyances may be stated in round numbers to be ten guineas. The abrogation of the passport system (as far as British subjects are concerned) in France has broken down many obstacles which previously beset the path of the traveller, and which were, above all, annoying to the invalid, who has usually but little strength to spare, and thinks that little ill bestowed in running after officials for the accomplishment of a useless form. The progress of the traveller is now greatly facilitated, and he will do well to eke out this advantage by as much civility as he may deem consistent with a due conservation of his dignity. A kind word often procures attention and respect, where an imperious command would beget a, perhaps merited, contemptuous neglect.

Having arrived at Marseilles, the invalid may wish himself at sea as soon as possible, especially if *docks* afford him no interest; at least I never could find anything attractive in this southern emporium beyond an exquisite view of the sea and surrounding country from the summit of *Notre Dame de la Garde*. The steamboats of the *Messageries Impériales* leave for Algiers three times a week, accomplishing the voyage in about forty-eight hours. They are well appointed, clean, and orderly. The price of living on board is included in that of the passage-money, an arrangement which appears to be generally satisfactory. Each sleeping cabin is occupied by two cots and a double set of crockery. A separate sleeping cabin is provided for ladies. The saloon is generally well fitted and commodious, and the *nourriture* all that need be desired. I have travelled very many times in different vessels belonging to this company, and I must pay a well-merited tribute of praise to the gentlemanly conduct of the officers, and to the kindness and attention of the steward and stewardess. I should be sorry, however, in thus commending the service of one company, to seem in any way neglectful of that of another enterprising firm who have likewise a line of boats on this station. Unfortunately I never travelled in any of the boats belonging to *MM. Touache Frères et Cie*, and therefore I cannot speak personally of their accommodation; but I understand they are somewhat less expensive than the others, and I have always heard them spoken of in the highest terms.

In fine weather the sail across the Mediterranean is very pleasant and healthful, and far more enjoyable than the night voyages along the coast of Italy. The course of the steamboat lies through the meridian of the Balearic islands, at which she will arrive in about twenty-four hours after

leaving Marseilles, but she does not visit them. *Minorca*, on the left or *port* side of the vessel, is the second in point of size of the Balearic islands, and the easternmost of those belonging to Spain. Its extreme length from west to east is thirty-two miles, and its mean breadth about eight. The coast line is sinuous and rocky. Its agricultural products are scanty, the soil being far from rich. *Mount Toro* has an elevation of 4793 feet. The following is the mean annual temperature of Minorca for the year, seasons, and months: —Year, 64·67. Winter, 54·32; spring, 62·02; summer, 77·33; autumn, 65·00. January, 53·29; February, 54·32; March, 55·74; April, 61·52; May, 68·81; June, 74·62; July, 79·23; August, 78·13; September, 72·23; October, 64·72; November, 58·06; December, 55·36.

Majorca, coming into view over the right or starboard bow of the steamer, as she passes Minorca, is the central and largest of the Balearic islands. Its surface is undulating, and more productive than that of the last mentioned island. The *Silla de Torillos* mounts to an elevation of 5114 feet. Majorca enjoys a mild and healthy climate.

On the morning of the third day, that is at about the end of the forty-second hour of the voyage, the traveller casts a penetrating look to the horizon before him, which is still a clearly defined circular margin, abruptly blue and white; he looks again, and the outline is dimly broken, it is the first sight of the Atlas Mountains. He has still, however, several hours of his voyage to accomplish; for these mountains are very lofty, and in clear weather may be seen from a considerable distance. It may be that his eye now rests upon the summit of *Zakkar*, a mountain upwards of 5000 feet high, in the neighbourhood of Milianah, or it may be that of *Mouzaïa*, upwards of 5200 feet high.

native of *Little* Atlas, but is c
the *Mitidja* plain. The bounda
(comprising a superficial area o
twenty-five square miles) are: th
Mitidja on the south; and on the e
the rivers *Haratch* and *Massafran.*
500 to 1300 feet. The elliptical for
adapts it to the deep and spacious b
soon to enter, whose limits are *Cap*
and *Pointe Pescade* (the most prom
range) on the west. Between these p
the Bouzaréah lie contiguous with
sweeping into the water, at others l
narrow slip of level seaboard. As th
still nearer, the traveller catches a gli
on the near aspect of this range of h
scends and widens in its downward c
the whole town of Algiers is brought
what pyramidal in outline, having it
waters of the Mediterranean, and its
side of the *Bouzaréah.* Th

a striking aptness to the simile which has been applied to it, of *a diamond set in emeralds.*

By this time the steamer has passed the lighthouse, and come to her moorings in the harbour of Algiers. And then follows a very *Babel* of tongues. Small boats in endless numbers surround the vessel whilst their various occupants, chiefly those of eastern costume, swarm up her sides, and join in the discordant *Yo, heave, ho!* which is as necessary to bring a rope to the required tautness here as elsewhere. Under the guidance of one or other of these fantastic looking creatures the traveller will descend from the vessel, and seek a domicile in one of the several hotels which solicit his patronage.

Having ascended by the steep route which directs from the port to the southern extremity of the *Rue de la Marine* just where it joins the *Place du Gouvernement*, he may wander into the centre of the latter open space, cast a passing glance over the equestrian statue of the Duke of Orleans, and finally contemplate the relative appearance of the two hotels which force themselves upon his gaze. With his back towards the sea he beholds before him—and, indeed, with the aid of a good telescope, he might have been acquainted with the same fact an hour before he entered the harbour—in bold characters, the words HOTEL D'ORIENT. The entrance to this hotel is by means of a commodious stair just within the Arcade, the entrance to which is flanked on the one side by the druggist shop belonging to my intelligent friend, M. Desvigne, and on the other by that of a tobacconist. The Hôtel d'Orient, I believe, is regarded as *the* hotel of Algiers. I spent several weeks in it, and always found it well conducted; mine host, Marius, being an active, enterprising, and agreeable manager. If there be a certain lack of home comforts about it, it is a

...on in the Place du Gouv...
Régence, which, as I learned from...
short time in it, is likewise an a...
residence. In the *Rue Bab-el-Ou...*
ing out of the south-west corner o...
de Paris, which, although it has n...
as in the other cases, is well cond...
many strangers. I have frequently...
although I never slept in it, and us...
it an agreeable change from the Hô...
fixed upon one of these for, at all eve...
dence, let the traveller come forth aga...
Gouvernement and scan the motley sce...

It is three o'clock in the afternoon o...
day; a military band is playing near...
and everywhere around are groups of f...
various subjects of a polyglot conversati...
side of the quadrilateral space, the only ...
houses, commands a view of the harbour...
the beautiful Bay of Algiers. It is protec...
balustrade from the open space bel...
a fish...

Frenchmen preponderate, and of these the military are the more numerous. Happy, gay, and somewhat frivolous in their bearing, they enjoy the present while it lasts, and think of the future only as the road to military preferment. The merchant Franks, although more sombre in dress and gait, assume as much as possible the cheerful aspect of their light-hearted brethren. Both are courteous, and ready to render the stranger a willing service. Another group may consist of a Spanish fruiterer, an Italian *pifferaro*, and a Maltese fisherman, the latter of whom may be master of a little broken English; and, if so, he will watch an opportunity of introducing himself. A few Portuguese, Germans, Swiss, and Turks, add to the sum of the Europeans. Of the natives, the first may be a Jew in eastern costume, more bent on gain than pleasure. Beyond him stands a Kabyle mountaineer, who has adventured amongst the Arab Sassenachs to traffic in the wares of his own industrious manufacture. The double-bernoused Arab, as he walks with stately step, acknowledges the salutation of a red-cloaked *Spahis* soldier, on whose breast hangs not only an order of the legion of honour, but, moreover, a goodly sized Victoria medal, a reward for his services in the Crimean war. Next comes the merchant Moor, haughty, supercilious, and purse-proud; but withal a man of handsome features and noble bearing. In the distance is a group of tattered *Koulouglis*, fishermen, past whom, in their usual shuffling trot, *four Biskri* are carrying a piano slung between two poles. And last of all, there stands a stalwart negro, whose trade it is to maintain the brilliant whiteness of the houses. Occasionally a female, completely shrouded in spotless garments, may be seen flitting in ghost-like silence to or from the Moorish bath, followed by her sable abigail, whose features are deemed unworthy of disguise.

...os of St Eugene. ... an op
structed with wide arcades on ea
affording shelter from the summ
the only level streets in Algiers; a
points, proceed the narrow and to
passages, which ascend in convergi
of the town, in the neighbourhood
where the profligate Dey bestowed t
upon the French ambassador which c
of his vice-royalty.

After this rapid survey of the town
importance to the invalid is the choic
He may first run through the room
ascertain whether apartments suited to
venience may be had there; if so, he w
to agree with the landlord for board
moderate price per month. Or he may c
furnished apartments in any of the lower
and take his meals only at the hotel.
price from about L.2, 10s. for a single roo
guineas per month for larger apartm...
pretty ...
ottages or ...

and gentleman, who, for twelve to fifteen guineas per month, offer all the comforts of a well-appointed household.

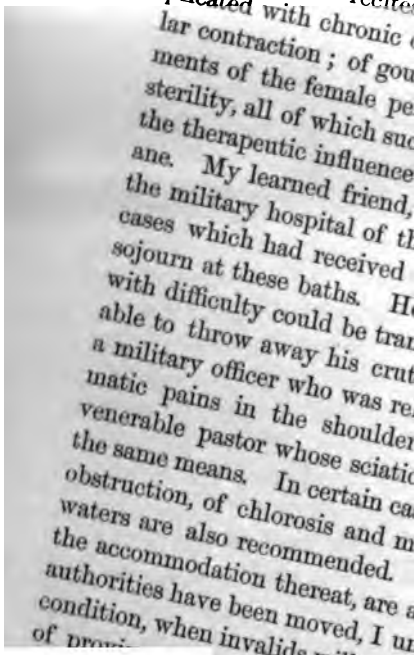
Before proceeding to consider the climate of Algiers in a strictly meteorological point of view, let me add a few general remarks upon the neighbouring scenery, and upon the mineral springs which abound in this province. During the rainy season, the roads towards the interior are frequently in bad condition, and scarcely admit of comfortable walking; but there are always a few favoured localities which permit of out-door exercise immediately after the heaviest falls of rain. And I may mention that there is a much better selection of carriages and horses than might have been expected; so that the invalid will find every facility for enjoying the neighbouring country; whilst, by means of the *diligence*, he may with more independence make several agreeable excursions within the range of the Little Atlas. The sea-beach beyond the *Champ de Manœuvres* forms usually a charming promenade, and by driving to it, at a cost of about a franc and a half, the valetudinarian can at any time assure himself of a pure and wholesome atmosphere, together with a dry and clean footway. The summit of the Bouzaréah in the vicinity of *El-Biar* commands an extensive view and a somewhat more bracing atmosphere than those places near the sea-level. The plain of *Mitidja*, which surrounds the *Sahel* range, separating it from the Lesser Atlas chain, is a flat tract of land receding from the coast near the *Maison Carrée*, on the east of Algiers, and between it and that part of the Atlas Mountains which constitutes Kabylia proper. After sweeping to the rear of the *Sahel*, which rises abruptly out of the plain, the Metidja again approaches the sea near *Cherchell*. This extensive plain was, scarcely more than thirty years ago, densely populated, and thickly strewed with native villages,

... come to alleviate the ills
result from the noxious emanatio
it will take a long time to reduce
wholesome cultivation. Of the
Medeah, Milianah, &c., it is beyo
Excursions to these places are amo
of a winter's residence in Algiers
attempted during the cold or rai
section *Algeria* will be found a bri
agreeable modes of travelling into the
applies to all the provinces, whether of
or Oran. It is one of the great advan
that it offers to the invalid so much t
amusing as well as instructive, at a
physical exertion; and more especia
him to be much in the open air in o
entertainments, whilst, at the same tim
possible of those pernicious raree-sho
other places, and especially throughou
insidious and baneful influence upon w

I hasten to give a brief history of
met with in the province of Algiers; a
upon those of HAMMAM-MEL...
a little ante...

summer, if not quite dry, at least reduced to a stream of most meagre dimensions. The word *Melóuane* signifies *coloured* or *mottled*, and is added to that of *Hammam* (baths), to convey the intimation of a coloured deposit which the waters leave in their course. There are several springs in this locality, but two only yield supplies of water sufficient for bathing purposes. Altogether, however, they are supposed to be capable of affording a daily supply equal to the requirements of six hundred bathers. The water of these springs is a clear, limpid, inodorous, and slightly unctuous fluid, having a specific gravity, according to Schaw, (*Voyages*, pages 301-302) compared with that of ordinary rain water as 910 to 830. As it passes away from its source to mingle with the stream below, it begins to yield an offensive odour, probably due to a decomposition of the sulphates. Its temperature varies a little, but has a mean of about 103°, and its physical constitution has been, with very nearly the same results, ascertained by the analyses of MM. Tripier, Simounet, Flageollot, and Marigny. In a thousand parts of the water, these gentlemen found the following solid ingredients:—Chloride of sodium, 26·069; chloride of magnesium, 0·326; chloride of potassium, 0·243; chloride of calcium, a trace; chloride of ammonia, a trace; carbonate of lime, 0·135; carbonate of magnesia, 0·080; sulphate of lime, 3·126; carbonate of iron, 0·002; silica, 0·015; arsenic, a trace; sulphate of magnesia, 0·187; oxide of iron, 0·020; bi-carbonate of magnesia, 0·015; bi-carbonate of lime, 0·117; phosphate of lime, a trace; bi-carbonate of iron, a trace; organic matter, a trace.

The gas, which is given off in great abundance from the waters as they make their escape from the earth, yields, on analysis, six parts of carbonic acid gas to ninety-four of that of nitrogen. These waters resemble



leaving the town by the Rue Bab-el-Oued. The water proceeding from this spring is a clear, colourless, inodorous, non-gaseous, limpid fluid, having a very slightly styptic taste. Its temperature is nearly that of the surrounding atmosphere, and varies a little with the seasons. It is not a very productive spring, scarcely yielding more than fifty gallons per hour. The saline ingredients obtained by M. Millon from a pint of the water were as follows :—Chloride of sodium, 4·848 ; sulphate of soda, 0·711 ; carbonate of soda, 0·941 ; carbonate of lime, 1·530 ; carbonate of magnesia, 1·158 ; carbonate of protoxide of iron, 0·108 ; silicate of lime (SiO, CaO), 0·463.

The virtues of this water are summed up in the following order, by a commission, consisting of MM. Pélissier, Bertherand, Ville, Millon, and Simounet, constituted by order of the Préfet of Algiers, for the purpose of examining the spring in August 1855 :—

The Spring of Oïoun-Sekhakhna, by reason of its peculiar composition, is obviously applicable to the relief of the pathological circumstances of the country, and by reason of its proximity to the town it is doubly valuable as a hygienic as well as a remedial agent. But they do not enter into the particular cases in which it is considered available as a medicine, nor do they quote any cases benefited by it. Perhaps a shorter deliverance might have been made with sufficient accuracy, by styling it simply *a good potable water.*

The hot springs of HAMMAM-R'IRA arise in the neighbourhood of Milianha, with which a diligence, by way of Blidah, is in regular correspondence. The thermal establishment is constructed on the side of a mountain, on the site of ancient Roman baths. The waters escape by ten or twelve debouchures from the side of the mountain and from the plateau above. They are not all of the same temp[illegible]

rectangular buildings
to the east, and of simple yet s
these is occupied by the *officers*
kitchen, and other offices. A se
ward, capable of containing from
third is set apart for the baths o
hot saline springs, three supply the
whose water differs a little, the lowe
the highest about 113° to 115°. To
fifteen hundred gallons of water per
south of the bathing establishment t
which has not been enclosed, and is
the feet and legs of horses, mules, and
thither in considerable numbers for the
These springs yield a hot, colourless
It has scarcely any smell at first, b
glass, and on cooling, it imparts a na
a sourish and slightly sulphurous taste,
of about 1·0029. After slight earthq
unfrequent in this country, the sprin
lific, and the water is rendered sandy
off at the same time a more marked su
chemical composition of these wat
MM

silica, 0·008; organic matter, 0·339; silicate of alumina, 0·040.

Among the cases treated successfully with these waters, either as internal remedies, or in the form of baths, Dr Delorrain enumerates the following, as having occurred in the year 1855:—Sciatica, 2; rheumatism and gout, 20; chronic effects of accidental injury or wounds received in service, 12; hemiplegia, 1; amenorrhœa, 2. And here I may mention, that although the thermal establishment of *Hammam-R'ira* is resorted to chiefly by the military, still civilians are received with the same attention.

The ferruginous springs of this locality are two in number, and are situated at a little distance from the thermal baths. One of these springs yields water at a high temperature, whilst that of the other is quite cold. The former is a clear, transparent fluid, ejected perpendicularly from the ground by means of ten or twelve jets. Its temperature reaches 156°. On cooling it has an inky taste; but it is in all conditions nearly inodorous. After exposure to light it throws down a copious precipitate of the sesquioxide of iron. The cold spring escapes in a running stream from the ground: it is situated about two miles from the bathing establishment, and affords exercise to the patients who walk to the place and drink it for the sake of its tonic effects. Of a quart of the former, M. Ville has given the following analysis:—Chloride of sodium, 8·213; sulphate of lime, 12·751; sulphate of magnesia, 4·199; sulphate of soda, 6·607; carbonate of lime, 4·416; carbonate of magnesia, 0·771; sulphate of soda, 4·230; silica, 0·092; oxide of iron and traces of phosphates, 0·402; organic matter undetermined; total, 41·681 grains.

Thanks to the indefatigable exertions of Dr Arthur Mitchell we enjoy an intimate acquaintance with the various

physical circumstances which operate in determining the climate of Algiers. Physicians and patients alike owe a tribute of gratitude to that gentleman for the pains which he has taken to obtain information for them on a subject of so much importance, and for the very lucid and unselfish manner in which he has placed the results of his labours before them. Dr Mitchell had occasion, in the winter of 1854–55, to spend some months in Algeria, and he took the opportunity—in a most exhaustive manner, both by personal observation and laborious research—to make himself acquainted with the merits of the country as a resort for invalids. I had the pleasure to peruse what he has since written on the subject, first in the "Gazette Medicale de l'Algerie," during my sojourn there, and subsequently in a small work published separately by him. The same information may likewise be obtained from the "Medico-Chirurgical Review," in which journal also Dr Mitchell set before his professional brethren the welcome information. From the works above mentioned; from the tables and other information afforded me by my kind and distinguished friend, Dr Bertherand, "Médecin principal de l'armée;" from the meteorological observations recorded and presented to me by my friend Dr Felix Bertherand; from the circumstances of pathological interest communicated to me by my friends MM. Foley, Troilier, and Negrin, medical officers at the large civil hospital of Algiers; and from a prolonged series of personal observations made in the winter of 1857–58, I have assembled the following facts, which I first present to the reader in a tabular form, with a view of making the information thus conveyed more readily consultable, and subsequently in the shape of a brief commentary upon the characteristic features of the climate.

Meteorological Table for Algiers.

	For the Year.	For the Seasons.				For the Months.												No. of Years of Observation.
		Winter	Spring	Summer	Autumn	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Mean temperature,	69·13	62·13	61·04	75·09	78·26	59·18	59·01	60·05	64·06	69·75	75 13	80·41	82·07	78·86	73·85	66·40	60·82	13
Mean difference in temperature of the successive,	...	16·13	1·09	14·05	3·15	1·64	0·17	1·04	4·01	5·69	5·38	5·28	1·66	3·21	5·01	7·45	5·58	13
Mean daily range of temperature,	11·41	12·00	10·56	10·32	12·78	13·86	12·06	10·08	9·54	8·82	10·98	11·16	9·00	13·50	15·84	10·08	12·06	5
Mean successive daily range of temperature, .	1·94	1·46	2·04	2·66	1·61	1·68	2·52	1·90	1·70	1·85	2·79	2 34	1·75	1·62	1·48	1·44	1·26	1
Mean extreme range of temperature, . . .	44·5	26·1	24·3	27·9	23·4	15·3	15·3	18·0	12·6	15·3	15 3	16·6	15·3	16·2	15·7	18·9	18·5	2
Mean height of barometer, . .	30·021	30·057	30·012	29·973	30·042	30·045	30·039	30·018	30·011	30·009	29·975	29·996	29·949	30·026	30·095	30·005	30·088	12
Mean extreme range of barometer, ...	·51	·65	·70	·29	·42	·86	·59	·70	·67	·74	·43	·29	·16	·39	·39	·48	·51	1
Average quantity of rain in inches,	36·18	17·34	7·79	0·87	10·18	6·01	5·27	3·23	2·80	1·76	0·57	0·05	0·25	1·20	3·61	5·37	6·06	16
Average number of rainy days, .	95·6	42·3	22·3	5·0	26·0	13·0	16·7	11·3	5·3	5·7	3 7	1·3	...	4·3	8·7	13·0	12·6	3
The number of days on which the wind blew from the																		
N., ...	203	30	52	84	37	11	7	12	28	12	31	27	26	8	19	10	12	Sum of 9½ years of observation.
NW., . . .	985	201	264	247	273	78	56	91	75	98	86	79	82	101	105	67	67	
NE, ...	392	45	101	145	91	11	27	34	28	39	35	53	67	43	33	15	7	
S., ...	74	37	7	6	24	6	16	5	1	1	1	2	3	3	8	13	15	
SW., . . .	305	108	69	36	92	48	37	26	22	21	13	12	11	21	35	36	23	
SE., . . .	88	29	31	3	25	7	7	12	13	6	1	...	2	8	5	12	15	
E., ...	328	34	84	148	62	4	14	33	28	23	38	56	54	22	23	17	16	
W., . . .	498	213	145	49	91	79	68	53	49	43	26	16	7	17	17	57	66	
Calm, . . .	413	115	75	100	123	35	22	13	26	36	39	34	27	46	34	43	58	

...ike degree to very fe...
winter resorts. Having the Me...
the excessive heat of summer is ...
and the temperature of winter is ...
great extent, by the same cause, fr...
The mean annual temperature, it w...
that of most European places of w...
cularly those of Italy; and there ...
difference between the mean tempera...
spring seasons at Algiers than at alm...
whilst its mean annual successive da...
any other of the acknowledged winter c...
perhaps, Madeira. The annual baro...
small. It may strike the reader at firs...
sequence of the heavy fall of rain, the ...
must necessarily be damp and relaxing, ...
the very reverse of this obtains. It mu...
that, although the quantity of rain in in...
there, is undoubtedly high, yet the nur...
which rain falls is decidedly low. Whilst ...
we have frequent rainy days, and very m...
rains unceasingly, yet the aggregate amount ...
siderably less for the year than in some ...
the fall ...
fewer ...

Moreover, what is called, in meteorological terms, a rainy day at Algiers may, in truth, mean nothing more than a very heavy shower of half-an-hour or an hour's duration. Rain usually falls in Algiers, then, in large drops and heavy showers, and no sooner is it over than the invalid may step forth with impunity and enjoy his out-door exercise; because, from the rapid evaporation as well as from the sloping of the ground upon which it stands, the superabundant moisture is rapidly carried off. It must not be forgotten, however, that after heavy rain the temperature of the atmosphere is always reduced, and its effects should be properly guarded against. The table shows that the months of November, December, and January, have the greatest falls of rain. Dews and fogs seldom visit Algiers during the winter season, nevertheless it behoves the invalid to avoid exposure too early or too late in the day. Of the winds, that blowing from the north-west preponderates, and, indeed, northerly winds prevail over more than half the year. The north-west wind is the least agreeable of these; but although it is usually cold and dry, it is always benefited by its passage across the sea, and bears no comparison with the noxious mistral of the south of France. According to M. Hardy, the conservator of the *Jardin d'Essai* at Algiers, when this wind prevails with vehemence for some time, the trees manifest symptoms of its injurious effects on those sides only, however, which are directly opposed to it. The sirocco, arriving at Algiers after its passage across the Great Desert, is a very oppressive wind; but fortunately it very seldom occurs; and, during my residence there, it was certainly never so overpowering as I have experienced it at Naples, and even at Rome. The south-west is regarded as the rainy wind. The Atlas Mountains, although usually covered with snow at high levels during the colder months,

...nessed in the town of ...
seven years.

Of course these general remarks
of several years, and therefore t
disappointed if, on spending a wi
meets with a season somewhat dif
the figures above quoted led him to
altogether uniform, and it is only b
can learn to appreciate one above an
we arrive at the summit of seasonal re
expect, as we shall assuredly find, c
vicissitudes which we would gladly
winter 1856-57, for example, so great v
in Algiers that very nearly the whole ar
year fell in that season between Nov
of February. Invalids who had resorte
impression that an occasional heavy s
had to encounter, were beyond measur
were not a little out of humour with
meteorologists who had, as they thoug
trouble merely to deceive them. Bu
exceptional year. It stamped the char
however, in an unfavourable manner

rain fell almost like sheets of water, converting, in a very few hours, rivulets into mountain torrents.

As a resort from the inclement seasons of northern Europe for persons threatened with pulmonary consumption, Algiers, in my opinion, is deservedly in good reputation. The climate is far from being of a relaxing character; on the contrary, it combines with its usual mildness and equability a decidedly bracing and tonic influence. Consumptive patients, in whom there is a well-marked deposit of crude tubercle, may pass one *or more* winters in Algiers with advantage, under circumstances which afford Nature the most ample leisure for repairing the disorganised structure. The sooner the patient is placed under its influence the more likely is the result to be beneficial. But when the disease has gone beyond what I have mentioned,—when the tuberculous deposit has broken down and softened, and when the patient is obviously sinking rapidly under the malady,—Algiers is not to be recommended. I saw two persons die there who should never have been allowed to leave the comforts of their own homes. The first case was that of a gentleman who, I am persuaded, had no idea of his dangerous condition when he was sent there; and he died without a friend to soothe his last moments, and with no one to speak to at all except those whose acquaintance he had made subsequent to his arrival in the place. The second was that of a lady who was comforted by the presence of a near and dear relative; but in her case, also, the change to Algiers only served to hasten the approach of death. Neither of these cases should have been sent away from home; it was an indubitable act of cruelty to recommend the change alike in both instances. Consumptive patients frequently crave for change of climate only when it is no longer available in the cure of their disease. Careless at

... it behoves him steadfastly
removal which would but add an
foreign cemeteries, visited so oft
passionate interest by that class e
most ample numbers victims to th

It is not necessary to prove abs
sumption from the natives of a cou
strate the beneficial influence of its
affected from other countries. It wo
such a place, unless perhaps in Gree
all events, approximates such a con
amongst his other labours, has collecte
following table from various sources.
cate *the mortality from Phthisis compar*
from all causes in different localities:—

Algeria	All classes of population,	.
	European—civil,	. . .
	European—military,	. . .
	Mussulmans,	. . .
London,		. . . . .
England and Wales,		. . . .
Paris,		. . . . .

	Proportion.	
	Deaths from Phthisis.	Deaths from all causes.
New York, ...	1	7·2
Boston, ...	1	6·6
Baltimore, ...	1	5·4
Charleston, ...	1	6·9

In other diseases, especially some of those mentioned when speaking of the mineral waters, the climate of Algeria might be resorted to with benefit. And particularly by persons whose disorders may be ameliorated by an entire change of scenery, and who derive advantage from that constant mental activity which attends a removal from place to place in a country previously unknown to them.

CHAPTER V

AUSTRALIA—TASMANIA—N

ALTHOUGH it would scarcely be ad
an invalid to seek the benefits deri
climate so far away from home as the
less I conceive there may be cases in
of the general features of the climate o
Zealand might be useful. A valetud
may have just so much interest in eitl
as to prompt him to undertake a voy
the benefit of his health, and partly
of his commercial pursuits; and in
acquaintance with the characteristics
enable him to select the most appro
out on his voyage, as it would

AUSTRALIA.

The vast extent of territory known by the name of Australia, or New Holland as it was formerly called, occupies a position in the South Pacific Ocean, to the south of the Asiatic Archipelago, between Lat. 10° and 39° S., and Long. 113° and 154° E. Its longest diameter is from east to west, being about two thousand five hundred miles in extent, whilst its extreme breadth is about eighteen hundred, within which limits is comprised a superficial area of 3,038,400 square miles. I regret that I have not space enough to dwell even briefly upon the topographical features of this interesting country. Over a land so extensive, the greater part of which, however, is still unexplored, a *terra incognita*, there must necessarily exist a great diversity of physical features, mountains, plains, deserts, pastoral lands, lakes, rivers, and marshes, giving rise, according to their distribution, to a diversity of climate, which is marked, moreover, by the proximity of the Equator; one-third of the country being in the Torrid, and the remainder in the South Temperate Zone. The climate of Australia, therefore, can only be described in a cursory manner, for, in truth, it is not one but many. There is one peculiarity about it, however, which must be remembered throughout; namely, that being in the southern hemisphere, and in a part of the globe diametrically opposite to our own country, its meteorological phenomena are generally the very reverse of those which we experience. When we are enjoying the social festivities of Christmas, the inhabitants of Australia are enduring the sultry heat of summer. December, January, and February are their summer months, whose mean temperature is about 80°; June, July, and August are their winter months. Northerly winds, which with us are im-

following division :—1. *New South Wales*; 2. *Port Philip*; 3. *South Australia*; 4.

1. ***New South Wales*** is situated on the eastern coast of **Australia**, and may be said, in general terms, to occupy the whole of the continent south of Lat. 28° and east of Long. 141° E.; but more correctly speaking, it is that territory which is bounded on the north by Moreton Bay, on the east by the Pacific Ocean, between Lat. 30° and 37° 30′ S., and extending in a westerly direction from 153° E., until it meets the eastern boundary of the South Australian colony, having the colony of Port Philip, to the south of it. The country is of a very diversified character, both in point of topographical features, and consequently in point of climate. In the vicinity of the coast the land is generally sterile and barren and unproductive, consisting chiefly of a light and sandy soil, with frequent rocky protuberances. Here, however, an infinite variety of flowering plants and shrubs of the most beautiful hues adorn the waste and invest it with a charm to the eye of the botanist; but it scarcely rears a single tree of any of the common dimensions, nor does it yield any of the ordinary agricultural products. At a distance of about five [illegible] there is a [illegible]

the most luxuriant pasturage, as well on the summits of the hills as in the depth of the valleys, which affords sustenance to innumerable flocks and herds. In this district there are scarcely any trees, and little or no underwood. The belt of mountains which traverses the colony is known by the name of the *Liverpool Range* in the north, as the *Blue Mountains* in the centre, and as the *Australian Alps* in the south. It runs nearly parallel with the coast, and at a distance from it of from thirty to fifty miles; it has an average elevation of 3000 to 4000 feet above the level of the sea, and serves to separate the waters which have an inland course from those which stretch towards the ocean. The rivers of New South Wales—and the same may be said of them throughout Australia—are strikingly disproportionate to the size of the continent, and render very little service as means of transit from the coast to the interior.

The climate of New South Wales is generally considered healthy. It presents a great diversity; so much so, indeed, that it is quite impossible to define it by any terms as one climate, for, like that of Australia generally, it is not one but many. The average temperature of spring, comprising the months of September, October, and November, is 65·5°; of summer 72°, of autumn 66°, and of winter 55°, giving an annual average of 64·6°. The average height of the barometer is 29·943. In Paramatta, the thermometer is frequently as low as 27° in winter; in Sydney it rarely falls below 40°. In the mountain districts and uplands the climate is much cooler, and at Bathurst snow is common in winter; whereas in the lower districts, as at Moreton Bay, the seasons are more moderate.

"Of the peculiarly salubrious climate of Australia," Mr Montgomery Martin, the talented author of the "British Colonies," says, "I can gratefully bear record, having pro-

colonies from Europe find much
restored to them. Not more than
will be found in a community of tw
at some of the military stations se
without the loss of a man; several
be upwards of one hundred years of

During the winter months (June, J
night air is generally very cold in N
the mornings and evenings are chill an
frosts are by no means uncommon eve
are much more frequent towards the i
considerable thickness is occasionally n
perature at this season averages from 4(
and from 55° to 60° at mid-day. A
amount of rain occurs during the wint
dew is very heavy, and fogs in low-lyi
cially on the banks of the rivers, are ve

During the spring months (Septe
November), at least during the early we
of the winter characteristics remain:
cold, and the mornings and evenings
warmth of noonday is perceptibly hi
prevail more or less.

during the spring months, but generally speaking, the weather is clear and agreeable.

During the summer months (December, January, and February), the temperature runs pretty high. It is moderated, however, by a regular alternation of land and sea breezes. The sea-breeze sets in about nine o'clock every morning, and continues to blow with increasing force through the heat of the day, declining again towards the evening until about six or seven o'clock, when the only really disagreeable part of the day follows, all nature appearing lifeless, until the land-breeze gradually springs up about eight. The sea-breeze blows from the north-east, and the land-breeze crosses the mountains from a point varying between the west-south-west and west. In those days when the temperature is very high the sea breeze sometimes changes towards the south, and blows with considerable impetuosity.

It is in this season that the hot and dry north-west wind occasionally blows. It seldom lasts longer than about twelve hours, and during its prevalence it puts an end to the land and sea breeze. It is generally followed by a cold and vehement southerly wind, attended usually by a fall of rain. It is during the transition from a north-west to a southerly wind that the greatest vicissitudes of temperature occur; a range of from 20° to 30° in little more than half an hour being not uncommon. After the southerly wind has blown from half a day to a day the usual land and sea breezes again supervene. Violent thunderstorms and heavy falls of rain are frequent during the summer months.

During the autumn months (March, April, and May) the rainy season passes over. In March, when the more regular rains occur, the temperature is very unsettled, and the weather generally disagreeable. Sometimes, however, it should be mentioned, several years pass with very little r

... the particular features of the
marked. To the east of the mou
temperature is greater than on the
or on the uplands to the west of the
their superior elevation, the clima
Snow often falls, and remains for
mountains in winter. The season
their changes, and more marked in
than on the east side of the mountain

The following table from Mr Mont
will give a general idea of the clim
figures, I understand, represent the mea

Months.	Barometer, 62 feet above the sea.		Hygrometer.		Radiator.		Thermometer.			W
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Med.	Min.	
Jan.	30·300	29·430	68	9	101	63	91	75½	60	
Feb.	30·200	29·680	75	35	94	48	90	74	58	
March	30·490	29·580	74	10	83	42	83	71½	60	
April	30·458	27·772	78	40	87	53	83	70	57	
May	30·442	29·602	79	26	66	35	73	61½	50	
June	30·350	29·290	78	25	67	32	62	52	42	
July	30·315	29·840	76	27	59	26	60	54	48	
Aug.	30·248	29·488	78	29	67	31	66	55	44	
Sept.	30·380	29·520	79	18	83	34	67	49½	42	
Oct.	30·200	29·300	80	20	86	42	82	69½	57	
Nov.	30·220	29·860	76	10	84	51	91			
Dec.	30·110	29·530	72	30						

as follows :—in 1841, the amount was 76·31 inches, and the number of rainy days, 142; in 1842, 48·32 inches in 137 days; in 1843, 62·78 inches in 168 days; and in 1844, 70·67 inches in 157 days. According to Strzelecki the following represents the average quantity of rain which falls annually, and during the seasons of summer and winter at several stations in Australia. The figures are reduced from 8730 days of observation :

New South Wales.	Summer.	Winter.	Annual.	Average No. of inches.
Port-Macquarie, .	37·58	25·10	62·68	
Port-Jackson, .	24·42	28·00	52·42	48·60
Port-Philip, . .	13·25	17·47	30·72	
Tasmania.				
Woolnorth, . .	19·68	29·07	43·75	
Circular Head, .	11 31	24·11	35·42	41·28
Port-Arthur, .	16·94	17·75	44·69	

Of the winds, the northerly and southerly are the most common; in winter the latter exceed the former in the ratio of 60 to 40; in summer, of 100 winds, 42 are polar. But this law is not common to the whole country. At Port Jackson polar winds prevail in winter, and equatorial winds in summer; at Port Phillip this is exactly reversed, whilst in Tasmania equatorial winds dominate in both seasons.

The hot and arid north-west wind occurs occasionlly in the summer months; it seldom continues longer than about twelve hours, and is followed almost invariably by a gale of wind from the southward. During the prevalence of this wind the thermometer rises sometimes as high as 117° in the shade, and even to 125° when fully exposed to its influence. It destroys all vegetation, and frequently blights both the fruit and agricultural produce. The mountain chain previously mentioned modifies the effects of this wind considerably; on the western side of it the temperature of

work, says—"Rapid gr
ment of the intellectual as we
characterise human life in New
among females. At fifteen, a girl
and many of the graces, of woma
admitted, that at the age of thirt
away, although the vigour of existe
springs of life seem to attain a r
arriving from Europe. Numerous in
arriving in the colony at sixty and
new vigour, and attained a hundred

Dysentery and pulmonary compla
diseases of the country. The forme
confined to the poorer classes and to
it is most frequently the result of a
spirituous liquors, and is usually asso
symptoms. The pulmonary complaint
ing, more or less confined to the you
are due to the sudden vicissitudes of
the climate is subject. They are not
matory action so much as by the prot
teristic peculiar to the milder Eur
of this country suffering from

amongst the aborgines subsequent to the visit of the vessel navigated by Captain Cook.

Diseases are said to assume a milder form in New South Wales than in European countries. According to statistics obtained from six of the principal gaols in the colony in 1848, the following disorders were found to prevail:—"Those of the brain and nerves, 75; circulatory organs, 20; respiratory organs, 154; alimentary canal, 282; hepatic, 9; eyes, 63; skin, 35; cellular texture, 28; fevers, 10; rheumatic, 84; dropsy, 1; scorbutic, 31; ulcers, 85; pregnancy and parturition, 6; wounds and accidents, 36; hernia, 1; teeth, 11; vermin, 25; other diseases, 119; children, 31; total 1158. The deaths during the year were—males, 13; females, 1; total, 14."

In comparison with other colonial stations, that of New South Wales bears a favourable proportion as to the number of deaths amongst the troops. According to statistics arranged by Colonel Tulloch, the average annual mortality per thousand of white troops stationed at the different places hereafter mentioned, during ten years ending in 1846, was as follows:—New South Wales, 11; Windward and Leeward Islands, 68·7; Jamaica, 66·9; Gibraltar, 10·9; Malta, 14·9; Ionian Islands, 15·5; Bermudas, 29·2; Nova Scotia and New Brunswick, 13; Canada, 12·6; Newfoundland, 9·1; St Helena, 15·4; Cape of Good Hope, 13; Mauritius, 24·4; Ceylon, 41·4.

The Reverend Dr Lang says of the climate—"The salubrity of the climate of New South Wales is indicated by the general health of the colonists; the diseases which actually occur being, in at least three cases out of every four, the result of excess and dissipation, rather than of those natural ills that the flesh is heir to in every country under the sun. Excess in the use of animal and other

...ained to believe that the pro
number of children born in the c
a similar number born in England

"Persons of temperate habits,
meridian of life before their arriva
live longer in the colony than th
England. . . . ."

Captain Clunie, in his official re
of climate, Moreton Bay [now inclu
being further to the northward, m
warmer than Sydney; and although
here, the thermometer ranges during
to 100°; but I have seldom felt it
India; and the nights are generally c
winter, except at our highest statio
seen; the mornings and evenings, h
very chilly, and for several months co
able. At this season the climate n
delightful.

"As a general observation, I may
New South Wales, that it is undoubt
important advantage is, that the inval
one district to another, may sele
the tempest

Bass's Strait, which separates it from Tasmania. The extreme length of Victoria, from east to west, is about five hundred miles, and its breadth, from north to south, about two hundred and fifty, including a superficial area of about 80,000 square miles. It presents a great diversity of physical features. It is generally covered with luxuriant grass, especially along the wide extent of undulating country towards the west. On the east is a chain of lofty mountains, from amongst which the Murray River takes its rise. I cannot dwell longer on its topographical peculiarities; indeed, I fear I have already enlarged too much upon the climate of Australia, and must therefore be content to touch more briefly upon the other portions yet to be mentioned. Victoria being nearer the pole than New South Wales, has a decidedly cooler climate; in winter the ponds are usually covered with thin ice for a few days, and snow is occasionally witnessed at low levels. The mean annual temperature of Port Phillip, according to Strzelecki is 61·13°; of summer, 69·4°; of winter, 53·3°; the maximum of summer being 90·6°, and the minimum 48·8°; and the maximum and minimum of winter respectively, 69·8° and 36·9°. November is the warmest month and July the coldest. According to Mr Westgarth, the climate during ten months of the year is exceedingly fine; "the dryness and genial warmth of the air," he says, "afford an almost daily access to the open country, and there appears in the general buoyancy of the population, a degree of enjoyment of existence far beyond what is usually exhibited in the duller climes of the fatherland." The following table represents the meteorology of Melbourne during the year 1845–46. The observations were recorded by Mr Westgarth at an elevation of 130 feet above the level of the sea.

	...	55·48	53·25	30·43	2
August .	...	57·38	53·77	30·22	2
September	56·10	63·50	59·66	30·45	2
October .	58·83	65·38	60·77	30·24	29
November	61·70	69·00	64·53	30·08	29
December	65·03	73·09	66·74	30·10	29·
1846.					
January .	**66·19**	**78·48**	**66·41**	**30·10**	**29·**
February	**68·85**	**72·32**	**65·67**	**30·28**	**29·6**
March .	**61·88**	**68·74**	**63·09**	**30·19**	**29·6**
April . .	**57·18**	**64·20**	**60·80**	**30·20**	**29·5**
May . .	**50·64**	**56·12**	**54·54**	**30·30**	**29·54**
June . .	**46·96**	**54·70**	**52·56**	**30·31**	**29·70**

"The hot winds," says Mr Martin, "
about the middle or end of Novembe
tervals throughout the summer until t
February. At Melbourne the hot wind l
tion during the summer, but the wir
quarter in winter are cold. During the
hot winds, the sky is generally clou
materially abates after sunset. The s
succeeded by a strong breeze from the
occasions a fall in the thermometer of 2
winter snow sometimes covers the grou
three inches, and ice is formed of the thi
It will be observed, that more rain fall-
in London. By mea-

Melbourne in the hottest summer, and the evenings even then are cool and refreshing.

Another writer, the editor of the "Port Phillip Gazette," in an excellent little work on the statistics and topography of Victoria, gives the following summary of its climate:—"Those northerly winds, which in the summer season are distinguished as the 'hot winds,' are far less frequent and injurious at Port Phillip than elsewhere. . . . So rapid is the process of vegetation,—thanks to the genial nature of the climate,—that the farmer can easily house his crops before the commencement of the hot winds. Vegetables of the larger size are frequently cut off by the simoom-like breath of these northerly currents of air; but in general the garden, with all its produce, suffers comparatively little.

"The winter months are cold and disagreeable to residents in town, but expansive and strengthening to the denizens of the bush. The spring is marked by sudden variations. The summer heat is often gratefully relieved by refreshing showers. The autumnal months, including February, March, April, and May, are of the blandest and most pleasant weather: cool winds, Italian skies, gentle rains (at night), and a bright clear atmosphere, impart a spirit of strength and activity to the inhabitants which is not surpassed by any country in the world."

3. *South Australia* extends from latitude 26° S. to the south coast of the continent, between Long. 132° and 141° E. It is bounded on the east and south-east by New South Wales and Victoria, and on the west by Western Australia. Its superficial area is estimated at 300,000 square miles. Its surface is generally level or undulating; the hills, as a rule, range from north to south; the highest point of which, east of St Vincent's Gulf, is not more than 3012 feet above the level of the sea. The

Adelaide, the chief city of the
the River Torrens, at a distance
from the sea; it stands upon rising
its inland position, has a milder ten

The climate of South Australia
vicinity of Sydney than any part
fluenced by lofty mountains, and th
equable than those climates which
winds which blow down occasiona
snow-clad summits of the Blue Mou
Alps. Southerly winds prevail duri
the year; they cross the Pacific in the
a cool, refreshing, and exhilarating
that the climate of South Australia
medial agent for alleviating the dis
Asia." The maximum and minimu
at Adelaide in 1844 is represented b
respectively:—January, 101 and 66
64; March, 95 and 64; April, 86 and
June, 68 and 48; July, 60·5 and 48
September, 70·5 and 49; October, 96
93·5 and 53; December, 103·5 a
figures represent 42

8; 1·900. August, 16; 3·040. September, 16; 4·540. October, 6; 1·900.

4. *Western Australia*, unlike the preceding provinces, is neither characterised by lofty mountain ranges, nor by deep littoral anfractuosities. It comprises all that portion of the continent to the westward of Long. 129° E., and extends from 13°44′ to 35° of S. Lat. Its extreme length, from north to south is about 1280 miles, and its average breadth 800, containing a superficial area of about 1,000,000 square miles. The province, as far as it has been explored, contains a variety of physical features; wastes and sandy plains alternating with luxuriant pasturage, besides regions of considerable agricultural produce. The vine, olive, and tobacco, thrive luxuriantly in this province.

The climate of Western Australia differs in many respects from that of the eastern side of the island, especially in an absence of the prolonged droughts which are occasionally experienced in the latter.

A greater quantity of rain falls along the south coast than elsewhere, and the temperature is there much milder and more equable. In the neighbourhood of Perth, the climate is dry and warm, with a reputation for salubrity. The hot winds prevail here in summer as in other parts of Australia; they generally blow from six to twelve days during the season. The mean annual temperature at 9 A.M. is 60°, and at 3 P.M. 69°; that of summer at the same hours respectively being 69·5° and 80°; and that of winter 52° and 59°. In the height of summer (January) it is said labourers work in the open air in the same manner as in this country. Mr Ferguson, the colonial surgeon, ascertained that the number of deaths in 1000 people bears the following comparison with several other places:—Western Australia, 12; New South Wales and Tasmania, 15; Cape

or Van Diemen's Land, as it
large island of the South Pacific
of Australia, from which it is s
between Lat. 40° 40′ and 43° 3
and 148° 25′ E. It is somewhat
configuration, having an extreme
about 200 miles, and a superfici
miles. The island possesses a diver
lofty mountains and dense and wid
prominent features, especially on the
comparatively but little inhabited.
mountain ranges, the one on the east,
side. Of the former, Ben Lomond is
elevation of 5010 feet, Mount Barro
being 4644 feet above the level of
Wellington, which rises close behind
feet. Of the latter, Cradle Mountain,
chain, is 5069 feet high; Valentine's Pe
tance of sixty miles, has an elevation of
man's Cap, 4756; Dry's Bluff, 4257; a
smith, 4075 feet high. The principal ri
are the Derwent and the Huon

The climate of Tasmania presents many features in common with that of Australia, modified, however, by its more southerly position, and by its insularity, as well as by its exposure to the prevailing polar winds. The hot north-west wind blows occasionally in summer, but seldom lasts beyond a few hours; during its prevalence, the thermometer rises sometimes to 100° or 110° It is followed invarably by a strong breeze from the south, attended by a fall of rain; and when this change takes place the vicissitudes of temperature are usually very extensive. Thunderstorms are comparatively rare in Tasmania, although very frequent in Australia; and even in the height of summer the evenings and nights are cool and refreshing. The seasons are the reverse of what we experience in this country; the winter months are June, July, and August, during which frost and snow is common in the interior and uplands, but the weather is never very cold during the day. The season is marked by refreshing showers. The three following months constitute the Tasmanian spring, during which the atmosphere is generally bracing and invigorating, the sky clear, or alternating with passing showers and high winds. Summer is made up of the months of December, January, and February. December is usually the harvest month. March, April, and May, are the autumn months, and constitute the most enjoyable season of the year. The sky is then clear and serene, the days moderately warm, and the evenings and nights mild and genial.

Mr Martin, in his work on the British Colonies, gives the following sketch of the meteorological phenomena of 1848. "The mean for the year 1848 was,—barometer, 29·739; thermometer, 52·3; rain, 23·67 inches. The average number of rainy days is in a dry year 100, and in a wet year 120. The hot winds during 1848 were

...nches fell between the 6
June and July were fine; Augus
of September and October were fin
ber severe,—constant gales with w
cember the thermometer was sev
with snow in quantity on Mount W
winds include six-tenths of all the
the year. The Aurora Australis
1848 as in 1847. Its most brilli
25th March. On October 18th and
it was very remarkable in Europe, it
seen in Van Diemen's Island, prob
state of the weather."

From observation of the amount of
in Hobart Town during several yea
quantity alternates from year to ye
was 22·84 inches; in 1843, 18·20 in
inches; in 1845, 15·89 inches; in 1
1847, 14·02 inches; and, in 1848, 23·

At Launceston, in the northern p
climate differs a little from that of the
the year 1848 the quantity of rain w
ton was 35·415 inches; the mean

scarcely be considered a fair representation of the salubrity of the climate, which is highly esteemed, and frequently resorted to by invalids from India :—

Diseases.	Cases treated.	Deaths.
Fevers, ...	201	8
Diseases of the Lungs, ...	357	47
... ... Liver, ...	31	6
... ... Stomach and Bowels, .	256	25
... ... Brain, ...	226	23
Dropsies, ...	14	5
Rheumatic Affections, ...	287	2
Venereal Affections, ...	230	1
Abscesses and Ulcers, ...	439	6
Wounds and Injuries, ...	279	8
Diseases of the Eyes, ...	553	0
... ... Skin, ...	41	0
Other diseases, ...	561	35
Total, .	3475	166

NEW ZEALAND

consists of two principal and several smaller islands in the Pacific Ocean, between Lat. 34° 12′ and 47° 20′ S., and Long. 166° and 178° 39′ E., at a distance of about 1200 miles south-east from Australia. The two principal islands are,—1. North Island, or New Ulster; and, 2. Middle Island, or New Munster. South Island, or New Leinster, a much smaller island, lies to the south of these. The united length of the two islands, which extend from NE. to SW. in an irregularly elongated form, is 1163 miles, the mean breadth being 140 miles, and the total superficial area of the whole of New Zealand about 95,000 square miles. These islands are of trap and volcanic formation, and contain several extinct and some active volcanoes. The chief mineral products are copper, manganese, and

forests can contribute, but g
a tamer kind, consisting of moderate
valleys, in the latter of which are
ductive of flax, reeds, and rushes. A
pasturage occasionally intervenes, whi
by an absence of animal life. Mr
gives the following succinct accoun
ance of the country: "Forest, thick
jungle, flax and fern, stunted or luxuri
soil, cover the chief part of the whole
tersected by innumerable water-course
cascades and waterfalls. Extensive
results of volcanic agency, are situated
both islands, and from them the prin
their source. The general outline of t
Zealand (especially the Northern), is so
most casual observer can scarcely glanc
tation on a map without being impresse
irregular, unaccountable shape. The coa
sometimes very pleasing, at others qui
eastern being generally far more invitin
stern

such regions, grow and flourish spontaneously and abundantly; nor is it a land inhabited by native animals adapted for the food of man, and easily obtained by the toils or chase. The islands of New Zealand are uncultivated wastes,—either of mountains covered with dense forests, of plains and lowlands covered with high fern and shrubs, or of swamps and marshes covered with rush and flax,—without any open spots of grass land for pasturage or of verdant downs and hills for sheep. In these vast tracts there is not to be seen a living animal wild or domestic. The traveller's path in the woods is never crossed by the bounding deer for his rifle to replenish his supplies, nor is his nightly bivouac ever disturbed by the howl or the dread of visits from more savage and ferocious animals. All is perfect silence and solitude in the extreme. The woods are comparatively destitute of the feathered race. The pigeon, the parrot, and the *tui* in certain localities, are the only species that abound." When Mr Terry wrote the above, he was unacquainted with several extensive pastoral tracts which were subsequently discovered in New Munster, and, to a less extent in New Ulster; nevertheless, the general description of the country, and especially that of the absence of indigenous animals, is faithfully rendered. The soil of New Zealand is generally poor, although there are occasional tracts in which the land is highly productive; it has been asserted even, that the extent of cultivable soil does not exceed from a tenth to a twentieth of the whole country.

The climate of New Zealand is necessarily marked by diversity, for the country is exposed in different parts of its extent to a variety of the principal causes which operate in the determination of climate.

"The prevailing winds are westerly; gales from the east-

westward may be expected; but w
to south-east, the gale may be expe
remarks are from the observations
of H.M. 58th regiment, by whc
table, compiled from observations m
feet above the level of the sea, was
servations were made during the
1849:—

Months.	Greatest Heat in Shade.	Greatest Cold during Month.	Mean Temperature.	Average Daily Range of Temp.	Power of Solar Rays.		Degrees.	No. of Days o
					Mean.	Greatest.		
Jan. (Summer)	88	49	67·0	17·0	99	122	7·0	
Feb. (Autumn)	89	50	69·0	17·0	105	124	6·0	
March . .	80	47	63·6	16·5	89	114	5·2	1
April . .	81	48	63·2	14·5	87	103	3·5	1
May (Winter)	74	45	56·9	13·0	82	95	3·5	1
June . . .	68	35	51·4	15·0	73	85	3·0	1
July . . .	68	33	51·0	14·0	75	90	2·1	2
Aug. (Spring)	66	36	51·8	12·5	78	90	2·6	1
September .	67	37	51·5	13·1	85	100	3·8	2
October . .	77	37	57·3	15·2	88	112	5·0	1
Nov. (Summer)	77	50	62·1	13·3	97	110	5·0	1
December .	79	49	66·0	17·0	101	114	7·5	
Total & Mean,	89	33	59·2	14·0	87	124	4·5	17

The northern island of the N

disease. "The climate of the northern parts of New Zealand," Mr Martin says, "may be considered as warm and humid, that of the southern as cold and humid. The quantity of rain that falls is not so very much in excess of New South Wales, but the terrestrial absorption is less rapid in New Zealand. More rain is said to fall in the neighbourhood of Kauri forests than elsewhere, which may be partly owing to the elevated ridges and steep declivities in which this tree delights; possibly also, these lofty groves exercise an electric action, causing the rapid precipitation of rain." North-west winds usually prevail during the winter months, and the south-east during summer; the latter being, perhaps, the more violent; indeed, the east coast is much more frequently visited by gales than the west. The climate increases in severity along the east coast towards the south; both rain and wind increase in quantity and impetuosity in a southerly direction from Cook Strait; and both at Christchurch and Otago the winter is said to be very severe, the cold glacial winds and sleety rain causing much inconvenience to the people in that region. At New Plymouth the climate is reputed healthy and temperate: vicissitudes of temperature are said to be less marked there than elsewhere; the seasons succeed each other more gradually, and are not excessive. The prevailing winds are the south-westerly and westerly; northerly winds bring moisture, and the southerly and south-easterly winds are cold and baneful. Thunderstorms are not unfrequent in the hot months, and occasionally the shock of an earthquake is felt, but rarely does any harm.

According to Dieffenbach the amount of rain that fell at Wellington, from April 1841 to February 1842, was 34·49 inches; the mean temperature of July (the coldest month), at the same place, was 48·7, the extremes of the

are—April, 1·86 inches; May, 3·11;
August, 4·56; September, 4·51; Oct
2·95; December, 5·47; January, 1·16
days during that period being 133.
during the winter months; but at tha
very heavy, and the fogs which then
and rivers in the interior are not gene
several hours after sunrise.

The proportion of deaths amongst t
tion of New Zealand has hitherto be
character of the climate. The introd
habits and customs is said to have g
maladies previously unknown amon
who were always regarded as a stro
lived, but not a prolific race. The intro
and spirituous liquors has been especiall
fluenza, scarlatina, consumption, and s
to Martin, "have committed great rav
natives, while, on the other hand, an
prevalent at Auckland, of a mild form
sumes a dangerous and highly infectiou
Europeans."

e these remarks on the Ang

	Annual.	Winter.	Spring.	Summer.	Autumn.
Adelaide . .	68·45	56·42	66·98	81·90	68·50
Auckland . .	58·58	50·75	56·83	66·92	59·83
Albany . .	60·06	55·58	57·32	64·10	63·20
Coburg Penins. .	82·79	78·48	84·09	84·54	84·03
Fort Dundas .	80·63	75·20	81·50	83·84	81·98
Hobart Town .	52·37	42·14	52·75	63·06	51·55
Macquarie Harbour	55·44	45·64	57·73	64·23	54·15
Melbourne .	57·04	48·78	56·49	64·83	58·08
Paramatta .	63·13	53·77	67·33	71·75	59·67
Port Jackson .	65·81	55·50	66·91	74·26	66·57
York . .	65·33	51·17	64·50	81·33	64·33
Woolnorth .	...	48·62	55·41	...	...

CHAPTER VII

CANADA—NEW BRUNSWICK—N
NEWFOUNDLAND, &

A BRIEF sketch of the climatological
British possessions in North America, ı
interest to medical practitioners, or t
may, nevertheless, serve to supply an
atum, without incommoding to any gre
in search of a more genial locality. Th
that region includes Eastern and Wes
Upper Canada), New Brunswick, Nova
Prince Edward Island, Newfoundland, t
dor, the Hudson Bay territories, Vancou
Charlotte Island, British Columbia, &c.
cerning the climate of the principal of
suffice.

CANADA

is a possession of considerable extent, l
length of about fifteen hundred, and a me
two hundred

territory, on the west by Lake Superior, on the south by Lakes Huron, Erie, and Ontario, the river St Laurence, the states of New York, Vermont, New Hampshire, and Maine, and the British province of New Brunswick; and on the east by the Gulf of St Lawrence and Labrador.

I shall not attempt to describe the physical characteristics of a country so extensive, partly because an account so condensed, as it would necessarily be, could but convey a very inadequate idea of the subject treated of, and likewise because it would be out of place to dwell upon that which has already formed the subject-matter of so many able treatises, from any of which the reader may obtain a knowledge of the topographical peculiarities of the country far more commensurate with the importance of the question than any which I could afford him within the narrow limits to which I am confined. Let it suffice for me to remind the reader, that the leading characteristic of Canadian scenery is its immensity; for from whatever aspect it is regarded, its features are well nigh immeasurable; its lakes, rivers, and cataracts, as well as its mountains and forests, being of the most stupendous order. Its climate, too, diverse as it must necessarily be, is marked by extremes of temperature, the winter season being exceedingly cold, and that of summer correspondingly hot; it is what is termed an *excessive* climate.

The effects of distance from the equator, and position with respect to lofty mountain ranges, are well exemplified in the varieties of climate which are seen to occur throughout Canada. The eastern province owes much of its severity to these two circumstances, whilst that on the west is much milder, in consequence of its being more favoured in this respect. Winter begins earlier, lasts longer, and is more severe in Eastern than in Western Canada. Snow

usually begins to fall in the former during the month of November, although it does not remain constantly on the ground until December, after which period, however, it covers the surface of the country to a thickness of several feet until the following May.

In Eastern Canada the frosts during the winter months are intense, but the atmosphere is usually moderately calm, with a general prevalence of currents of air from the north-west, which give rise to clear and agreeable weather. Occasionally, however, south-east winds prevail, raise the temperature several degrees, and fill the atmosphere with heavy clouds, which not unfrequently precipitate their contents in the form of dense snow storms. The thermometer during winter occasionally falls as low as thirty degrees below the zero of Fahrenheit's scale, *minus* twenty being about the average temperature. A peculiar meteorological phenomenon frequently occurs about the month of January, when, from a temperature considerably below freezing-point, the thermometer suddenly, perhaps in the course of a single day, rises two or three degrees above that point, indicating the commencement of a rapid thaw. This state of matters generally continues for about ten days, when it yields again to a frost even more intense than that which had preceded it.

The Canadian enjoys the winter season perhaps more than any of the others; he protects himself against its severe cold by means of thick furs, in the shape of cap, cloak, and gloves, whilst his nether extremities are sheltered in worsted hose, outside as well as inside of his boots. Thus attired he is almost constantly abroad in his *carriole*, and, whilst grim frost has put an end to the pursuits of agriculture and navigation, by covering the ground with a thick and warm mantle of snow in the one case, and by converting the surface of the rivers into a solid mass of ice

in the other, he gives himself up to a round of gaieties; for his period of labour extends through the genial months of summer and autumn, but in winter all the cares of business are laid aside, and give place to picnics, dancing, sleighing, and visiting of every description. The only dangers which he has to contend with are, frost-bites, losing his way in a snow-storm, or breaking suddenly through a piece of thin ice; from all of which, however, he is usually very expert in delivering himself. Within doors the temperature is maintained by means of well-regulated stoves, which although inferior to open grates in a sanative point of view, have the effect of preserving the atmosphere at a uniform degree of warmth. The outside walls of the houses are generally covered with plaster, to prevent the imbibition of moisture, which would otherwise, during the severe frost, burst them asunder.

Winter begins to abate in the vicinity of Montreal during the early part of April. The warmth of the sun has then considerable effect upon the masses of snow and ice; and by the middle of the month spring may be said to be fairly introduced. This transition takes place at Quebec about three weeks later. During the time when the ice on the banks of the river above Quebec, and in the lakes beyond, is breaking up, the St Lawrence presents a curious and dangerous appearance. It is sometimes choked up with masses of ice, varying in diameter from 400 to 500 yards; and any vessels attempting to navigate the river at that season are exposed to the danger of being crushed between two or more of such masses.

Of the winds which influence the weather, the north-east, after crossing the dreary Labrador, are productive of the greatest cold; and when they prevail, the winters are unusually severe. They bring snow in winter and rain in

summer. Those from the north and north-west, which dominate during the winter months, are cold and dry, giving rise to a clear and sharp atmosphere. The prevailing winds over the whole year are those from the west, the genial breezes of summer being those from the west and south-west. East winds occur more or less in every month, but are most frequent in April and May.

Mr W. Evans of Côté St Paul, in his "Agricultural Report" for Eastern Canada in April and May, describes the spring of that province in the following terms:—"Early in April well-prepared soils are in good order to receive the seed, and about the 10th or 12th wheat-sowing very generally commences. The pastures should now be good, and will soon improve the condition of the cattle [all of which, as well as sheep and poultry, are kept in the house during winter]. Dairy produce abundant in the market, and the prices moderate. Notwithstanding the shortness of the seasons that farmers have here to work in the fields, Canada is by no means unfavourable for farming, and in ordinary seasons, with the seed got in early, on soils well prepared, a good crop of all kinds of grain, wheat particularly, may generally be obtained. With command of labour, which continued emigration will give, the farmer has only to employ double the number of hands for the working season, while the days are long and fine, that he would have required in England for the whole year, and he may get all his work done, perhaps at not a greater expense, and the labourer will have his summer's earnings to take to the woods (if he has a family), to commence farming on his own account, which should be the ultimate aim of all the labouring class of emigrants, if they expect to secure future independence for themselves and their families. At this period the country is charming; after a

long and gloomy winter, the earth is again renovated—new life restored to plants—the trees dressed in leaves and blossoms—the fields in beautiful green, and all nature appears to rejoice." Summer follows quickly. It usually commences about the middle of May, with light showers, and a rapid increase of the noonday heat, although that of the night is still comparatively low. During June, July and August, the average temperature is 75°; but occasionally the heat is very oppressive, when the thermometer ranges between 80° and 95° in the shade. The storms of thunder and lightning, which are frequent in summer, are occasionally of the most appalling description.

In *Western Canada*, the climate, although very diverse, is much milder than that of the Eastern province, the winters being less severe, and the summers less fervent, the heat of the latter being alleviated by a refreshing breeze from the south-west, which continues usually from about ten in the morning until three or four in the afternoon; and, moreover, the prevailing winds of that season arrive in a similar direction, crossing in their course the vast lakes of the country, from which they abstract a good deal of moisture. The north-west wind, the prevailing one of winter, is dry and cold; the south-east, on the other hand, is mild and humid. Easterly winds accompany the longest storms of rain and snow. A writer on the climate of Lake Ontario gives the following sketch of it, as the result of many years of observation on its shores, in the vicinity of Toronto:—"The climate on the shores of Lake Ontario," he says, "is in many respects genial. The temperature, proceeding westward, is sensibly much milder, and this effect is still further increased by the presence of so vast a body of water, mitigating both the heats of summer and the cold of winter. Even a very short distance

inland, the difference in both respects is plainly perceptible to the most superficial observer. The early frosts, which occasionally do so much damage, are here comparatively harmless. What is a storm of rain on the shores of the lake, is frequently snow but a few miles further back from it. The snow likewise disappears much sooner in the spring, and the average depth is considerably less. In short, it may fairly be said, that to an emigrant from the British Isles to Western Canada, the change is no less surprising than agreeable. There is a clearness, a dryness, a brilliancy in the atmosphere truly delightful after the raw drizzling rains, the fogs and moisture of Europe; while the extremes of temperature are never of long duration, tempered by the fresh gales sweeping the surface of the magnificent Ontario. And if it be admitted that the weather ot spring is occasionally variable and unpleasant, this is more than compensated for by the brightness and beauty of the summer and autumn, often extending far into November. There is no doubt but that spring commences at least a month or six weeks earlier than in Quebec and Montreal; that the extremes, and likewise the sudden variations of temperature, are of far less intensity. Winters in Upper Canada sometimes occur with scarcely any snow at all, and a very moderate degree of cold—a fact never noticed in the lower province; and the further westward we proceed, the more favourable is this difference." The great lakes of Western Canada are never completely frozen over; and even the smaller ones rarely make ice of more than about an inch in thickness before Christmas, and there is none left at the beginning of April. Sleighing, too, seldom commences before January, and is generally over by the end of March; and it is even said that the labouring man may carry on his work in the open air at all seasons,

which would be perfectly impossible in the northern regions of the lower province. The severe frosts of Western Canada seldom continue more than two or three days without some abatement, and there are usually several days of mild weather intervening between the frosts. There is another peculiarity about the atmosphere of Upper Canada which I may mention in concluding these remarks; namely, its peculiar *non-oxidising* effect upon metal exposed to it. In the neighbourhood of Toronto, I have often heard it said, instruments made of iron or steel may be exposed for a long time to the open air, both night and day, without the least appearance of rust upon them; and on this account, too, iron bolts are made use of instead of copper ones in the construction of vessels intended to navigate the lakes.

The following table will serve to show the general difference between the climate of Upper or Western, and that of Lower or Eastern Canada :—

Table of Comparison between Upper and Lower Canada.

Months.	West Canada. Thermometer.			East Canada. Thermometer.			West Canada. Weather.			East Canada. Weather.		
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Days Clear.	Days of Rain or Snow.	Days Cloudy.	Days Clear.	Days of Rain or Snow.	Days Cloudy.
January	48	—20	18·17	33	23	11·14	13	8	9	23	4	4
February	50	8	23·87	40	29	10·69	11	10	7	21	3	5
March .	52	0	26·94	47	26	12·13	21	8	2	25	3	3
April .	83	40	59·70	81	9	48·91	23	3	4	25	3	3
May . .	92	40	67·32	92	30	67·84	22	5	4	23	4	4
June . .	97	57	77·51	95	55	76·34	22	8	...	26	2	2
July . .	103	60	81·37	103	62	82·23	25	3	3	26	3	2
August .	99	55	73·24	100	58	74·7	21	5	5	16	12	2
September	92	33	64·45	90	30	59·16	21	5	4	18	8	5
October .	74	24	48·	55	9	32·24	13	8	9	16	5	8
November	54	10	34·53	40	—13	17·44	11	14	7	14	7	10
December	41	— 2	25·43	43	—21	11·94	11	12	8	23	2	5
Year. .	73·8	25·72	48·37	68·25	11·75	42·1	214	89	62	256	56	53

Perhaps the most disagreeable feature in the climate of Canada is the frequent and wide range of temperature. The thermometer at Quebec has been known to range from between 36° and 40°, with rain during the day, to many degrees below zero during the following night. These vicissitudes are less severe towards the west; but even there a change of 30° in the twenty-four hours is not uncommon. The more marked alternations of temperature occur in the early months of winter, and the atmosphere becomes steadier as the year advances; February perhaps being subject to the greatest extremes of temperature. The average annual number of days on which there is frost in Canada at 8 A.M. is 112.

The climate of both provinces is generally regarded as being healthy and favourable to longevity; it is much milder at the present time than it was formerly, and the spread of cultivation is still daily rendering it more genial.

NEW BRUNSWICK.

This portion of British North America lies between 45° and 48° of north latitude and 63° 48′ and 67° 30′ of west longitude. It is bounded on the north by Chaleur Bay, on the south by the Bay of Fundy, on the east by the Gulf of St Lawrence and Northumberland Inlet, and on the west by Maine and Lower Canada. At its south-eastern extremity it is connected with Nova Scotia by means of an isthmus of not more than fourteen miles in width. Of this country but a small portion comparatively is cleared, the larger part of it being still covered with dense forests.

New Brunswick presents considerable diversity of scenery, over a surface for the most part of a boldly undulating character without being what might be termed mountain-

ous. The acclivities are, however, in many instances precipitous and of a somewhat alpine description, offering a pleasing contrast to the rich valleys, the extensive plains, the noble forests, with here and there a lake and river adding to the sum of its many natural attractions. The soil, as far as it has been cultivated, is rich and fertile.

Like that of the North American continent generally, the climate of New Brunswick is marked by its wide annual range of temperature, having a severe winter and a very hot summer, as well as by its extreme diurnal range, which is not unfrequently upwards of fifty degrees. The winds from the north and north-west are cold and biting, having previously passed over an extensive glacial region. Southerly winds are warm, and that from the south-west gives rise to dense fogs on the shores of the Bay of Fundy, which, however, do not extend more than about twenty miles inland. There is considerable difference between the climate of the sea-board and that of the interior, the former being humid and the latter dry. At Fredericton, in Lat. 45° 57′ N. and Long. 66° 45′ W., the mean annual maximum of temperature is about 45·5, the mean annual minimum being 37·75; the mean daily average 41·65, and the mean extreme daily range 22·00. During the year the east wind generally blows upon 159 days; the south upon 17; the west upon 87, the north upon 44; and other variable winds upon 58. During the same period there are usually 245 fair days; 52 of rain; 47 of fog; and 21 of snow. From the 21st of December to the 21st of March the cold is intense, and there are only, on an average, five days during that period in which the temperature is not below the freezing point; after that the weather gets gradually warmer, although for a long time the nights are very cold. The greatest fall of snow occurs in the month of February

and the early part of March and is accompanied by violent gales of wind, which sweep the snow with great vehemence across the country, but they rarely last longer than one or two days at a time. Agricultural pursuits are resumed soon after the beginning of April; hay is won about the middle of July, and the corn harvest takes place in August and September. Autumn is perhaps the most pleasant of the seasons at New Brunswick, and being protracted to the month of November, through what is termed the "Indian summer," it goes far towards the alleviation of the coming winter. The climate of New Brunswick is reputed healthy; and in proof of its sanative influence, and the consequent longevity of its inhabitants, a return made to the House of Assembly in 1846 of the pensions paid by the province to old soldiers and their widows is sometimes quoted. According to that return, there were in Carlton County twenty pensioners, of whom one (George Sinnett) was 112 years of age; one was 98; and the others averaged from 70 to 90. In York County there were thirty-six, of whom three were upwards of 90, eleven upwards of 80, and twelve upwards of 70. In Charlotte County there were thirty-six, one of whom (Susanna Watman) was 101 years of age, sixteen whose ages ranged from 80 to 97, and twelve from 70 upwards.

NOVA SCOTIA

extends from 43° 35′ to 45° 40′ of north latitude, and from 60° 35′ to 60° 10′ of west longitude. Its surface is greatly diversified. With the exception of Prince Edward Island, its superficial area is less than that of any of the British possessions in North America, although in a political point of view it is one of the most important. The country is

well watered, upwards of 3000 square miles of its surface being occupied by lakes and rivers. Its shores are irregular and abrupt, presenting numerous harbours having continually deep waters. The soil generally is rich and fertile.

The climate of Nova Scotia, like that of North America generally, is subject to great vicissitudes of temperature, even so wide a range as 52° in twenty-four hours having been observed. Fogs are very common along the seaboard, especially in the months of May and June, but they do not penetrate to any great distance inland. The atmosphere is characterised by its humidity, and falls of rain are much more frequent and prolonged than in this country. The mean extreme annual range of temperature is less in Nova Scotia than in the more western possessions, for in the former the thermometer rarely sinks lower than six or eight degrees below zero in winter, nor does it usually rise higher than about 88° in summer. Winter lasts from December to the end of March, during which period the ground is commonly covered with snow, after which there is a rapid transition to summer, spring being scarcely perceptible. Autumn is a prolonged and agreeable season. Nova Scotia is considered a healthy station, and the inhabitants are said to "enjoy a remarkable degree of health, and an almost total exemption from those intermittent and remittent fevers which affect the constitution in Canada." The diseases most frequently met with are those of the pulmonary apparatus, abscesses and ulcers, affections of the stomach and bowels, diseases of the eyes, &c.

The prevailing winds of Nova Scotia are from the south and south-west in summer, and the north and north-west in winter, with occasional easterly winds during the brief season of spring. The mean annual, seasonal, and monthly temperature is as follows:—Year, 40·08. Winter

spring, 31·67; summer, 61·00; autumn, 46·67. January, 20·00; February, 18·00; March, 25·00; April, 30·00; May, 40·00; June, 50·00; July, 63·00; August, 70·00; September, 51·00; October, 51·00; November, 38·00; December, 25·00.

The climate of Cape Breton is very similar to that of Nova Scotia, and is reputed even more healthy; that of Prince Edward Island is more severe in winter, during which the thermometer often indicates a temperature of 20° to 25° below zero, and the ice does not usually break up until nearly the end of April.

NEWFOUNDLAND.

This insular possession, lying off the coast of Labrador, is comprised chiefly between Lat. 46° 40′ and 51° 37′ N., and Long. 52° 25′ and 59° 15′ W. It is separated from the mainland by the Strait of Belleisle, is of generally irregular outline, and has a superficial area of about 36,000 square miles. Towards the north-west and west the country is somewhat rugged and mountainous, but on the east side it is generally flat and low. The surface of the land is occupied to a great extent by a marshy and unproductive soil, although many of the plains afford excellent pasturage, and raise vast herds of deer.

The climate of Newfoundland varies according to position, that of the north being widely different from the southern climate, and that of the sheltered west from the more exposed climate of the east coast. Winter sets in about the beginning of December, and continues until the middle of April, January and February being the coldest months; but snow does not cover the ground during so long a period, nor are the frosts so severe as in Western Canada.

Gales of wind along the coasts are very common. The north-west wind here, as in Canada, is the coldest of all, and is very severe in winter. The easterly winds are more humid. North-easterly winds are cold in all seasons, whilst those from the south-east are warm. The summer of Newfoundland is shorter than that of Canada, and the season of autumn is not so reliable; whilst that of winter is said to be "a series of storms of wind, rain, and snow." The fogs of Newfoundland are very dense, and are most prevalent in the month of May and beginning of June, the south and east shores being more subject to them than those of the west. They are believed to cause no injurious effects upon the inhabitants of the adjacent country, many of whom attain great ages. According to an *Army Medical Report*, "the climate of the southern portion of Newfoundland is similar to that of Nova Scotia, except that the summers are colder, of shorter duration, and liable to more sudden vicissitudes, owing to the melting of the icebergs on the coast, which exerts considerable influence on the temperature. The island has also long been noted for the frequent and dense fogs which prevail along its banks, and often continue during a great part of summer. None of these agencies, however, seem to operate prejudicially on the health of the inhabitants, among whom the mortality is on a lower scale than in any portion of the American continent. According to the population returns, the deaths are only 1 in 76 of the population; an exceedingly low ratio, indeed, especially when it is considered that upwards of 20,000 are children under fifteen years of age. As the inhabitants are scattered over a great extent of coast, several of the deaths may possibly have been omitted; but even making all due allowance for that source of error, their rapid increase, without any material aid from immigration, furnishes sufficient proof

that the climate, however unpleasant to the feelings, is highly favourable to the constitution."

The annual average of the thermometer over Newfoundland for six years is the following:—January, 22·7; February, 22·6; March, 24·0; April, 33·8; May, 39·5; June, 49·8; July, 57·4; August, 58·3; September, 53·3; October, 44·0; November, 34·0; December, 26·0.

BRITISH COLUMBIA—extends from Lat. 49° to 55° N., and from Long. 115° to 113° W. There has been but little opportunity hitherto of testing its climate; but it appears to be of comparatively mild character. The health of the soldiers in the year 1859–60, according to Assistant Staff-Surgeon Seddall, was, "without exception," excellent. The limiting days of frost were 1st November 1859 and 14th May 1860. The prevailing winds during November, December, and January, were westerly; during the remainder of the year, southerly. Thunder-storms are infrequent. The following table shows the temperature of each month, together with the humidity of the atmosphere, the amount of rain, and the number of rainy days. The observatory is situated in Lat. 49° 12′ 7″ N., and Long. 122° 49′ 15″ W.:—

	Inches.	Days.	Humidity.	Mean Temperature.
1859.				
June	0·594	5	·650	65·5
July	0·717	7	·690	68·6
August . . .	1·770	6	·707	69·4
September . . .	4·588	14	·841	60·6
October . . .	11·519	15	·875	50·9
November . . .	6·275	14	·848	35·9
December . . .	4·245	12	·908	32·7
1860.				
January . . .	9·498	16	·950	35·7
February . . .	6·652	20	·897	39·7
March . . .	4·561	16	·752	46·7
April	2·750	12	·699	50·7
May	3·260	15	·708	56·8

CHAPTER IX.

CAPE OF GOOD HOPE—NATAL.

THE British colony of the Cape of Good Hope occupies the southern apex of the African peninsula, between Lat. 26° 45′ and 34° 51′ S., and Long. 16° 20′ and 28° E. Its length in an east and west direction, from the mouth of the Orange River to the Drakenberg Mountains, is 900 miles, and it has an average breadth of about 400, comprising a superficial area of nearly 170,000 square miles. The country is formed by terraces rising in steppes from south to north. The principal mountain chains, from west to east, are the Drakensteen, Zwarte Berg, Sneeuw-Bergen, in which Compass Berg, the culminating point of the colony, is 9000 feet in elevation, and, on the borders of Natal, the Quathlamba or Drakenberg Mountains. Table Mountain, an insulated, flat-topped mass, forming by its southern point the promontory of the Cape of Good Hope, has an elevation of 3582 feet. Cape Agulhas, about half a degree further south, is the southernmost point of Africa.

The colony consists of an east and west province, each of which is divided into several districts. The coast is indented by several bays of considerable dimensions, of which St Helena, Table, False, St Sebastian, Mossel, Plettenberg, and Algoa, are the chief. The rivers or streams are not suited

for navigation, being rapid whilst they exist, and usually absent in summer. Where the colony is well watered its soil is highly productive, but the general appearance of the country is one of dryness and sterility. The most extensive plain is that of the *Great Karoo*, an arid tract of more than 200 miles in length, and about 50 in breadth. The steppes, or *karoos* as they are called, are destitute of trees, and display an evanescent vegetation only after heavy rains. The only mode of communication between these terraces is by what are termed *kloofs*, narrow and hazardous mountain passes, some of which have, however, been made tolerably convenient for the use of wheeled vehicles. The flora of the colony is variegated and beautiful, but serves little in point of utility. Corn is raised in the colony in a profitable manner. The vine, too, is assiduously cultivated; and the grazing of cattle and sheep forms an important item in the occupation of the colonist.

The seasons at the Cape of Good Hope are very nearly the reverse of those in England. The summer is there constituted by the months of December, January, and February, and the season of winter by those of June, July, and August. The climate of the colony varies with position and elevation above the level of the sea. Sudden and marked vicissitudes of temperature are very common all over the country; and although they are said to exercise no pernicious effects upon the inhabitants generally, it must obviously be a matter of the first importance to invalids to protect themselves as much as possible from them. In summer, the western province may be said, in general terms, to enjoy more agreeable weather than that on the east side, which is liable to stormy winds and heavy falls of rain; but in winter the eastern division has the advantage of a clear and bracing atmosphere, whilst the west is

not unfrequently visited by boisterous and unpleasant weather. The prevailing winds in winter are those from the north-west, which, after passing over the arid plains of the interior, are deprived of their usual searching sharpness before arriving at the colony. In summer, the winds from the south-east dominate, and not unfrequently blow with considerable impetuosity, cooling the hot atmosphere after their passage across the wide expanse of the Antarctic Ocean. Hot winds occasionally blow from the interior during the summer months, but the inhabitants of the sea-board are comparatively little affected by them. In the lofty plateaux of the interior, as well as in the mountainous districts, the seasons are marked by a wider range of temperature. In spring and autumn south-westerly winds usually prevail. They are generally overburdened with moisture, which, by condensation in the vicinity of the mountain summits near Cape Town, fills the atmosphere with cold fogs, and not unfrequently gives rise to moderately heavy falls of rain, accompanied with sudden changes of temperature, and occasionally with unpleasant blasts. Earthquakes are sometimes experienced in the colony, but they are not usually of a serious order. A very disastrous storm of wind and rain occurred in July 1822, requiring no less a sum than £125,000 to repair the damage which it caused to property of every description. Thunder-storms are not unfrequent; they become progressively more violent towards the tropics. The following table, showing the mean and extreme barometric pressures, and the mean and extreme ranges of temperature, as well as the amount of the rain-fall in inches, is taken from the observations made during the year 1858 at the Royal Observatory of Cape Town, near the sea-level, in Lat. 33° 56′ S., and Long. 18° 28′ E:—

Months.	Barometer Corrected and Reduced.			Thermometer.					Mean Moisture of Air. Saturation = 100.	Rain-fall in Inches.
	Monthly Mean.	Highest of Month.	Lowest of Month.	Monthly Mean.	Highest of Month.	Lowest of Month.	Mean Highest Reading.	Mean Lowest Reading.		
Jan. .	29·949	30·258	29·686	72·9	92·0	53·8	75·2	59·4	67·3	1·222
Feb. .	29·936	30·193	29·733	76·3	98·7	54·0	76·4	60·1	68·1	0·984
March	30·012	30·308	29·773	68·0	84·4	51·6	74·4	58·9	66·4	0·826
April	29·987	30·268	29·642	68·3	89·8	46·8	74·1	56·7	66·9	2·645
May .	30·124	30·542	29·781	56·5	72·8	40·3	64·4	52·1	80·6	0·754
June .	30·123	30·419	29·770	57·6	74·2	41·0	62·2	50·7	81·7	2·978
July .	30·172	30·416	29·683	49·3	62·6	36·0	57·1	45·6	83·9	4·726
August	30·047	30·379	29·671	56·4	68·8	44·0	60·4	50·3	79·5	5·608
Sept. .	30·126	30·479	29·703	63·8	83·0	44·7	64·3	51·6	75·1	2·695
Oct. .	30·070	30·294	29·898	65·0	81·5	48·5	67·7	54·5	69·9	1·101
Nov. .	29·989	30·294	29·518	69·8	88·0	51·6	73·8	57·5	65·0	1·102
Dec. .	29·939	30·193	29·602	71·3	90·4	52·2	75·8	59·3	63·7	0·040
Mean for yr.	30·039	30·337	29·705	64·7	82·2	47·0	68·8	54·7	72·3	24·23 Sum.

As regards the salubrity of the climate of the Cape of Good Hope, if we may put confidence in Army Medical Reports as being fair representations of the general mortality from diseases of every description, it must be regarded in a favourable light when compared with that of many other of the British Colonies. It is recorded that only *nine* out of every 1000 men in the service in the eastern province of the Cape of Good Hope die annually, and that not more than 13 out of every 1000 of those in the western province die yearly; whilst at Sierra-Leone 480 of every 1000 men employed in the service there die within the same period; 121 in Jamaica; 78 in the West Indies generally; 48 in the Madras Presidency; 28 in Bermuda; 27 in the Mauritius; 25 in St Helena; 21 in Gibraltar; 16 in Malta and Canada; and 14 in Nova Scotia and New Brunswick. Although the colony is not exposed to the ravages of epidemics, its inhabitants do not

generally attain a great age. Fevers are not common, but dysentery is the scourge of new comers, and of all who do not exercise a due caution in their habits of living. Consumption is frequent amongst the Hottentots, who die in considerable numbers by it. The Kafirs are healthy, and colonists, by a judicious use of hygienic means, may maintain their health unimpaired. Rheumatism is, perhaps, the most common disease of the country.

Invalids from India often derive benefit from a season spent at the Cape of Good Hope, or at Natal. The best residences for them in the former are to be found at Rondebosch and Wynberg, in the eastern province. Of the latter I now come to speak more at length.

NATAL.

The colony of Natal occupies a position between 27° 20′ and 30° 55′ of S. Lat., and 28° 12′ and 31° 30′ of E. Long. upon the south-eastern border of Africa, and at a direct distance of 700 miles from the Cape of Good Hope, from which latter possession it is separated by the independent country of *Kafraria*. It is bounded on the east by the Indian Ocean; on the west by the Quathlamba, Kathlamba, or Drakenberg Mountains; on the north and north-east by the Buffalo, or Umzunyati, and its prolongation the Utukela or Tugela River; and on the south by the southern branch of the Umzimkulu, or Umzimkuluana, by which it is separated from Kafraria. Its greatest length from north to south is 250 miles, and its average breadth, from the mountains to the coast, about 150 miles, including a superficial area of upwards of 18,000 square miles. It is constituted chiefly of a basement of granite and gneiss overlaid by sandstone, through which, at a remote period, vast quantities of molten

rocks have been projected, forming irregular masses of *trap*, which may be recognised in various localities as constituting extensive undulating plains and ridges, and occasionally strewing the surface with gigantic boulders. The Quathlamba chain of mountains, with its lofty and table summits, forms a characteristic feature in the background of Natal. From this range numerous offshoots are projected, usually in a direction from west to east, many of which approach the coast, and divide the country into distinct localities. These lateral spurs, as well as the main range itself, give rise to innumerable streams which wend their way towards the ocean, and afford in their course a never-failing supply of water. From the sea-board to the mountains the land rises by a succession of terraces, which are occasionally broken by rocky gorges and steep ravines. The colony is divided into the districts of Pieter-maritzburg, Umvoti, Impafane, Upper Tugela, and Umzimyate. Pieter-maritzburg, the capital of the colony, is situated at a distance of fifty miles from Port-Natal, which is near the centre of the coast line.

The littoral district of Natal has an average breadth of from twelve to fifteen miles, and comprises an area of about a million of acres. It is a strip of great luxuriance, and is peculiarly the region of tropical produce. It is protected from the sea by a range of low hills which are covered at intervals by a thick jungle, consisting of small evergreens, occupying a belt of from half a mile to five miles in width, with occasional tracts containing trees of larger magnitude. This region is technically called "the bush." Within this belt is a rich and undulating country, diversified by grassy slopes and shaded valleys, and ornamented with a variety of tropical plants. The uplands of the colony, which have an average elevation of 2500 to 3000 feet above the level of the

sea, are known as "the grazing grounds." They supply the meat and dairy produce required in the more densely populated districts below. The reader desirous of minute details respecting the colony of Natal will find an excellent account of it in a little work compiled under the direction of the Government Emigration Board, by Dr Mann, Superintendent of Education in Natal.

The proximity of Natal to the tropics invests its climate with a peculiarity nearly allied to that in which there exists a perennial vegetation. The seasons are neither marked by so regular a succession, nor by such great changes as in regions nearer the poles, and the range of difference between the length of day and night is much more circumscribed, the longest day being only one of fourteen hours' duration, whilst the shortest enjoys a sunlight of not less than ten. Winter may be said to commence in the month of April, and to end in the month of September. During this season the temperature of the "midland terrace" falls to 45° or even to 40° in the night, and the atmosphere is at the same time filled with moisture. Early in the mornings the temperature is still low, and the air often loaded with a dense mist, which imparts a chilliness requiring the use of additional clothing. The sun dissipates the fog between eight and nine o'clock, and the thermometer then rises rapidly to 66° or 70°, and continues pretty high until evening, when, after sunset, the cold returns, rendering a wood fire cheerful though not essential. "A large majority of the inhabitants of both Maritzburg and Durban know nothing of fires beyond the cook's domain, from the beginning to the end of the year. The routine of sunniness is continued day after day. During the six winter months of the year 1858 there were only twenty-four days of unbroken cloud, and there were eighty-three days of unin-

terrupted sunshine. The highest reading of the thermometer (*in the neighbourhood of Maritzburg*) was 90°. The mercury fell only twice to 38°; six times to 40°; and thirty-three times to 45°. There were only two days when the thermometer did not rise in the day to the temperature of 60°. The average highest temperature for the three coldest months was 69·3, and the average coldest temperature of the night for the same months was 47·7. The lowest reading of the thermometer on the sea-coast (at Durban) during the winter of 1858 was 43°. The mean temperature of the six winter months at Maritzburg was 60·7. The mean temperature of the winter months at Cape Town, deduced from observations carried on during fourteen years, 57·2. Thus the mean temperature of the winter of Maritzburg was 3·5 above the standard of Cape Town, and that of Durban was 8·3 above the same standard; the winter of the sea-coast in Natal being 4·8 warmer than that of the midland districts near the capital." (*The Colony of Natal*—Dr Mann.) The winter nights are generally clear and starlight. The winds which prevail during that season are from the seaward during the warmth of the day, generally a fresh south-easter, and from the west and north-west in the mornings and evenings. Comparatively little rain falls in winter; the amount which fell during that season (six months) in the year 1858 having been not more than 4·8 inches at Maritzburg, whilst, however, it amounted to 13·2 inches on the sea-coast; and the number of rainy days at the former place did not exceed thirteen.

The year appears to be constituted of two long seasons only, namely, winter and summer, the intervening seasons of spring and autumn being scarcely appreciable. Summer may be said to begin in October and to end in March. It is

the rainy season, and is likewise marked by the frequent occurrence of violent thunder-storms. The summer day usually sets out with a clear, bright sun; and when a storm is to take place, the clouds generally begin to gather about three o'clock in the afternoon, soon after which the rumbling of distant thunder is heard, and the storm rapidly supervenes; it is followed by a deluge of rain, during which the arena wherein the elements are performing their violent evolutions is gradually shifted, and the storm drifts out to sea. In the six summer months of 1858–59 rain fell on eighty days near Maritzburg, the amount being 21·06 inches. During the same period storms of thunder and lightning occurred on seventy-two days, on forty of which they were very near to Maritzburg. A disagreeable "hot wind" blows occasionally during the summer months from the north-west. It generally begins early in the morning, and continues until the afternoon; but it seldom lasts longer than eight or ten hours at a time. The temperature of the atmosphere is suddenly raised on the approach of these winds as high as from 85° to 95°; and it is so dry that all kinds of manufactured wood shrink, opening the seams of the floors and the joints of furniture, a consequence which is sometimes attended with considerable noise and violence. The hot winds seldom blow in mid-winter; they usually begin in the month of August, and are characterised, moreover, by their impetuosity. They rarely reach the coast line, so that the inhabitants in the vicinity of the sea are very seldom exposed to their injurious influence. "Upon several occasions," Dr Mann says, "when the hot wind was blowing furiously at Maritzburg, during the months of August and September, with the thermometer ranging between 85° and 90°, there was a gentle east wind at Durban, with the thermometer ranging between

75° and 78°. It seems very much as if the scorching breeze were the advanced guard of a strong current rushing from the north-west over the higher central plains, and carried by its mere momentum beyond the ledge of the Drakenberg, and some distance along the lower slopes, until its forward course is checked by the resistance and antagonism of the denser air setting in from the sea over the coast lands." Heavy storms of hail sometimes occur in summer, and not unfrequently do considerable harm to the crops. Travellers are usually compelled to seek shelter from the enormous pieces of ice, some of which weighing three quarters of a pound have been found immediately after such a storm. These showers are generally of limited extent, and are happily not of frequent occurrence.

The climate of Natal enjoys a reputation for salubrity, and is believed to possess considerable sanative virtues, by which invalids from European countries may have their disorders alleviated. Intermittent fevers are unknown in the colony, and cholera has never yet shown itself there. Gastric fevers are not uncommon; they generally make their appearance during the short transition period between summer and winter, but they are not of a severe kind, and are usually amenable to ordinary treatment. Diarrhœa and dysentery follow the excessive summer heat, and the skin is liable to a vesicular eruption of a rather obstinate character about the commencement of winter. A good deal of indisposition is likewise the result of a neglected *hygiene;* alcoholic stimulants especially being a fertile cause of disease. Exposure to the sun in the summer months is another manner in which incautious colonists and invalids contract maladies of a serious nature. But with a moderate amount of caution, the immigrant, whether strong and healthy or of delicate constitution, may guard himself from the more

serious diseases of the country; and by a careful observance of dietetic and other regimen, invalids, whether from India or Europe, might find a residence in Natal of considerable benefit.

"The kind of house most suitable for the climate," says the writer of a prize essay upon the subject, "is a sort of bungalow of a single storey, with a steep-pitched thatch roof which extends all round eight or ten feet beyond the walls, and is supported upon posts at the edge. The windows of the apartments are thus made to open into cool and shaded verandahs, and the direct rays of the sun never fall upon the walls themselves. When the rooms of the house are sufficiently large and lofty, and are separated from the sloping part of the roof above by boarded ceilings, dwelling-houses built upon this bungalow plan are very salubrious and comfortable. It is one strong recommendation to this style of architecture that the walls may be entirely made of sun-dried bricks. The broad thatched verandah affords such a perfect protection from the effects of the rain, that walls built of these simple and comparatively uncostly materials last as long, and are in every sense as serviceable, as those made of kiln-dried bricks, or of stone."

The following table is constructed from observations made by Dr Mann at the residence of the Bishop of Natal, six miles east of the city of Maritzburg, at an elevation of fifty feet above that city, and 2055 feet above the level of the sea, in Lat. 29° 30′ S., and Long. 30° 8′ E.; and likewise from observations made at the gardens of the Horticultural Society of Durban, at the base of the Berea Hills, about ninety feet above the level of the sea, and three miles from the shore, in Lat. 29° 53′ S., and Long. 31° 2′ E. In both cases the figures refer to the [illegible] of the climate in the year 1858:—

Months.	Maritzburg.										Port of Durban.				
	Barometer Corrected and Reduced.			Thermometer.					Mean Moisture of Air.	Rainfall in Inches.	Thermometer.			Mean Moisture of Air.	Rainfall in Inches.
	Monthly Mean.	Highest of Month.	Lowest of Month.	Monthly Mean.	Highest of Month.	Lowest of Month.	Mean Highest Reading.	Mean Lowest Reading.	Saturation = 100.		Monthly Mean.	Highest of Month.	Lowest of Month.	Saturation = 100.	
Jan. .	27·682	27·981	27·356	68·3	93	52	76·1	60·8	78·6	2·59	74·2	93	57	75·6	3·210
Feb. .	27·745	27·993	27·461	73·3	96·8	53	82·3	63·3	70·7	2·12	77	91	61	71·6	3·104
March .	27·769	28·139	27·429	69·4	91	42	78·6	60·8	71·7	3·62	73·6	91	51	78	12·138
April .	27·734	28·183	27·212	65·6	85	43·5	75·5	56·1	69·9	1·36	70·9	89	47	82	4·494
May .	27·941	28·226	27·515	59·5	79	38	71·5	47·5	60·6	0·00	64	83	44	76	0·404
June .	27·899	28·158	27·640	58·6	78·2	39·3	78·2	39·3	66·4	0·08	63·6	86	48	76·6	0·959
July .	27·884	28·152	27·606	58·1	81	38	69·6	47	65·6	0·14	62·4	81	45	77	2·988
August	27·823	28·153	27·571	61·3	89·8	43	70·6	52	55·8	3·15	65·2	81	49	72	3·928
Sept. .	27·676	28·304	27·487	64·4	90	42	74·8	54·1	70·5	0·07	67·1	87	47	71	0·286
Oct. .	27·812	28·082	27·546	63·8	89	50·5	70·8	56·8	84·3	2·99	65·9	84	56	85·3	9·915
Nov. .	27·781	28·109	27·339	68·2	88·5	52·4	75·9	60·6	79·6	3·81	72	93	55	86·3	5·029
Dec. .	27·415	28·058	27·440	69·3	92	54·6	76·6	62·0	76·0	5·21	74·0	92	55	84	7·721
Mean for year	27·763	28·294	27·466	64·9	87·7	45·7	75·0	54·9	70·8	25·14 Sum.	69·1	87·6	51·2	77·9	54·12

CHAPTER X.

FRANCE: WINTER RESIDENCES.

SEVERAL localities which fell but a little while ago to be described amongst the winter climates of Italy, are now to be placed with those appertaining to the south of France. Of this now extensive tract of country I need say little in general terms, as the character of its climate will be sufficiently brought before the reader in the description of the places following. The average mean annual temperature is about 5° higher than that of the south of England. The mean annual quantity of rain is about twenty-three inches, varying with longitude, the south-west being more humid than the south-east in about the same proportion as the corresponding localities in this country. The south winds falling upon the coast from the desert on the opposite side of the Mediterranean, are baneful to invalids, and frequently do considerable mischief amongst the agricultural products. The north-east winds blow coldly from the neighbouring Alps, and check vegetation during their prevalence. The north-west wind, or *Mistral*, a glacial, withering wind, blows with impetuous vehemence frequently during the winter and spring months, and is hostile in the extreme to patients suffering from delicate chests and especially where phthisical symptoms predominate. Exclusive of the re-

cently annexed territory, the south of France affords little or no protection in winter and spring for invalids suffering from delicate chests. Pau is the nearest approach to a climate of sufficient mildness for such cases; but it is relaxing, and suited only to a limited number. In her new possessions, however, there are one or two places, such as Mentone, which possess tolerably genial winter climates.

The climate of the south-east of France, comprising Languedoc and Provence, is characterised by a dry, hot, unsettled atmosphere, and is one of the worst in the world for consumptive invalids. It is in this division of the south of France, too, that the winds so frequently mentioned on account of their pernicious effects upon persons of delicate constitution, are most trying. The north wind, or *Bise*, adds intensity to the dominating feature of the season: in winter it is exceedingly cold, in summer excessively hot; but in both it is marked by a peculiar dryness. The east winds are likewise very hurtful; they are more humid. The mistral reigns here, and is worse than any of the others in its effects upon persons suffering from chest complaints. Comparatively little rain falls in these departments; and not only that, but there is very little moisture in the atmosphere, and on this account it is very irritating to the air-passages.

Some towns are more sheltered than others, such for instance as *Cannes* or *Hyères;* but even in those most protected, the changes of temperature are sudden and wide; the air is still dry and irritating; and even the best of them are unfitted as winter residences for consumptive invalids. On the other hand, however, where a dry bracing atmosphere is required, and when the severity of the winter and spring winds can be borne, the climate of the south-east of France may be cautiously recommended.

CANNES—in the department of *Var*—occupies a charming position on the bay of the same name, at a distance of four hours and a half by road from Nice. The neighbourhood possesses some of the finest scenery which the south of France can boast of; a graceful background of wooded uplands, with the sea containing the *Lerins* Isles, of historic interest, in front. The neighbourhood affords ample opportunities for out-door exercise, and the bay is inviting to those who are fond of aquatic sports. Cannes is well protected from cold winds, as is evidenced by the multitude of oranges which arrive at maturity and are sold there. It is more humid and less irritating than the climate of Nice; and since better accommodation has been provided, many resort to Cannes in preference to Nice in winter. Cases of chronic affections of the mucous membrane lining the air-passages, in which there is an intolerance on the one hand of the irritating atmosphere of Nice, and on the other of the humid and relaxing climate of Pau, might find the climate of Cannes better adapted to them.

HYÈRES—in the department of *Var*, ten miles east of Toulon—is situated on the southern slope of a hill, and commands a view of a valley of great fertility, at about two miles distance from the sea-board. Although more protected perhaps than most places in *Provence*, Hyères is not altogether free from noxious winds. According to the observations of M. Denis, the various winds are distributed over the year in something like the following order:—The south wind blows on 120 days; the east on 65; the west on 40; the north-west (mistral) on 27; the north-east and south-east each on 20; the south-west on 18; and the north on 12. From this it will be seen that the mountains in the vicinity do not altogether interrupt the approach of cold winds. The mistral occupies a fourth rank in

of frequency. In spring, the east, south-east, and north-east winds prevail; the two former of these are mild and humid winds, whilst the latter induces a clear and serene atmosphere. In summer, the south, south-east, south-west, and occasionally the north-west winds prevail. Their excessive heat is alleviated by their passage across the water (except the latter which, however, only follows severe storms). In autumn, the south-east, west, and north-east winds preponderate; and the latter being antagonistic to the two former in point of humidity, procures for the climate a greater number of fine days than would otherwise be the case. In winter, although somewhat protected, Hyères is subject to the cold winds which infest other parts of Provence. The north-north-east wind predominates in that season; it is a cold noxious wind, and having previously traversed the Alps, offers a marked contrast to the moist winds ariving from seaward. The south-east and south winds alternate with the former; and the mistral occasionally gives rise to sudden changes of temperature, and to an atmospheric condition exceedingly hurtful to invalids at this season. The climate of Hyères is tolerably mild and dry. The temperature rarely falls to freezing point, and snow is seldom seen; but in 1820 the whole of the orange groves were destroyed by a prolonged frost. The surrounding country affords facilities for out-door exercise, and for those who have strength to contend with a rather fickle temperature, it has peculiar attractions. The range of temperature is greatest during the mornings and evenings, when there is usually a change of wind either from a land to a sea breeze, or *vice versa*. For patients of leuco-phlegmatic temperament, with chronic affection of the air-passages, requiring the influence of a somewhat dry maritime atmosphere, or for those persons suffering from certain forms of

dyspepsia, Hyères may form a tolerably good winter residence; but in cases of inflammatory affections of the chest, as well as those suffering from phthisis in any form, it should scarcely be recommended.

MARSEILLES—has nothing to recommend it as a residence for invalids. Its climate partakes of the general features of that of Provence, and in many circumstances in its worst form. In winter it is cold and irritating, being subject to the evil influence of the mistral in all its vehemence. The vicissitudes of temperature are sudden and wide, and the accommodation for out-door exercise is very limited and of inferior description. The atmosphere is usually dry and irritating, and frequently filled with dust, especially in the narrow winding roads to which the invalid would be confined for exercise. In summer the heat and dryness of the atmosphere is excessive. The mean annual temperature of Marseilles is 58·32; that of the seasons and months being as follows :—Winter, 45·22; spring, 55·91; summer, 72·93; autumn, 59·21. January, 43·18; February, 45·39; March, 48·38; April, 56·12; May, 63·23; June, 70·99; July, 75·90; August, 71·89; September, 68·72; October, 58·73; November, 50·18; December, 47·10.

MENTONE—is the largest town of the principality of Monaco, lately ceded by the Italians to France. It is situated at the base of the Maritime Alps, about thirteen miles to the east of Nice, on the Cornice road leading from that town to Genoa. The town is built upon the sloping sides of one of the lower ranges of hills, which, stretching easily towards the sea, divides the bay upon which it is situated into two unequal parts. The country immediately in the vicinity of Mentone is clothed in exquisite verdure, crowned with trees of varied aspect, and gives shelter in the warmth

its ravines and sunny slopes to groves of lemon trees; facts which determine the mildness of its climate, for the latter, at all events, cannot bear the least degree of frost. The loftier mountains in the rear are they which form effectual obstacles to the approach of cold winds, and are usually rugged and barren, having a varying height of from 3000 to 4000 feet. Mentone is one of the cleanest and most comfortable looking towns met with along the Riviera, and has probably a climate unequalled in mildness and regularity by that of any town on the coast of Liguria, if not by that of any town in southern Europe. The summits of the lower hill range are usually occupied by pines overlying forests of olive trees, which appear to bear with some degree of impunity the brunt of the cold weather; elsewhere are orange groves less sturdy than the former, but still strong enough to bear a moderate degree of frost without injury to their annual crop of fruit, and without prejudice to the delicious fragrance of their blossom, of which the atmosphere of the Cornice road is so powerfully redolent. Lower down, and in greater seclusion, are the groves of lemon trees —delicate indices of the weather—in constant bloom, bearing their quadruple crops. A single degree of frost is sufficient to destroy this delicate fruit, and the tree itself cannot exist through more than two or three degrees; so that the proprietors of these groves become exceedingly anxious when a cold night is threatened, and often sit up to watch the thermometer. Nearly the whole of the valuable trees of the country were destroyed about five and twenty years ago by one night's frost.

Mentone is effectually screened by the Maritime Alps from the north-west (mistral), the north, and north-east winds. The south-west (libeccio) is slightly felt; whilst the winds from the direct south and south-east (sirocco)

have free access. As at Nice, the north wind bounds from the summits of the mountains behind into the sea at a considerable distance from the shores, scarcely falling on the town at all. Dr Henry Bennet, who spent two winters at Mentone for the benefit of his health, has recorded some very valuable data relative to its climate. Speaking of the rain-fall he says,—"On one night in December 4½ inches fell in ten hours. The total rain-fall last winter was 23·68 inches, from October 9th to April 21st; October, 8·02 inches; November, 2·21 inches; December, 6·96 inches; January, 3·24 inches; February, ·18 inches; March, 1·26 inches; April, 1·81 inches. These data were given me by a friend, Mr Smith, of Rome, who kept an accurate register. According to my own observations, it rained in November five days, in December five, in January four, in February one, in March six, and in April up to 23d, eight days—in all, twenty-nine days, from November 3d until April 23d. In October, I was told, it rained nearly every day. I constantly saw it raining on the upper hills, or a few miles out at sea, when it was quite clear and fine at Mentone—a fact easily explained, and which partly accounts for the peculiar dryness of this place. During the six months that I was at Mentone I never once saw a fog, day or night, morning or evening. Generally speaking, the sky was clear, and the sun shining in the heavens like a globe of fire. So powerful were its rays, that even in December or January it was disagreeable to walk in it without a lined parasol or umbrella. Owing to the power of the sun, the freedom from fog, the slight amount of rain, and the dry, rocky character of the soil, the air was usually very dry; so much so, that a wet towel would dry in the open air, out of the sun, within an hour or less, at any time in the winter, except when it rained or the sky was obscured."

Like all places in such situations, Mentone is subject to heavy falls of rain, when the ravines and stream-beds, which are dry during the greater part of the year, are suddenly filled with torrents of water, washing down fragments of rock and the detritus of the mountain sides. From the quantity of limestone which enters into the geological formation of the neighbourhood, the water of Mentone is very hard; and as it contains a large proportion of lime in solution, this circumstance should be duly weighed when considering the climate in a medical point of view. The mean annual and seasonal temperature of Mentone has not, so far as I am aware, been accurately recorded. In general terms, it is a little higher than that of Nice, at the same time that the daily range and vicissitudes are less felt in the former than in the latter place. The alternation of sea and land winds is not so well marked here as at Nice, but it exists nevertheless. And although in some respects Mentone may afford a winter residence preferable to that of any other Italian town, yet it must be remembered that its daily temperature is altogether dependent upon the heat yielded by the direct solar rays, and, therefore, that transitions from sunshine to shade are to be carefully avoided; and in taking out-door exercise, the invalid should be guided in his apparel by the indications of a thermometer kept always in the shade, protecting himself from the solar heat by means of a parasol or light umbrella. Dr Bennet, who has a favourable opinion of the climate of Mentone, cannot refrain from adding, that when "the sun was obscured by clouds, and rain fell, as miserable and chilly a state of things as a drizzling November day in England" characterised it. With a proper attention to such hygienic rules as are imperative on invalids wherever they may be, a winter at Mentone may be advantageously recommended to persons

who require a moderately dry and not over-stimulating atmosphere, cheerful and picturesque scenery, and ample opportunity for out-door exercise between the hours of ten and four, in five days out of six.

MONTPELLIER.—This city formerly enjoyed a reputation, ill acquired, for the sanative influence of its climate, as it does at the present day, and justly, too, for the excellency of its medical school, although even that has probably passed its zenith, and shows symptoms of decline beneath the baneful effects of *centralisation*. Montpellier was the type of a winter residence; so that it became fashionable to speak of places having a mild and genial winter climate as *the Montpellier* of the country. The erroneous idea of the salubrity of Montpellier, at all events in phthisical cases, however, has long since been dissipated; but not until it was discovered that about one-third of the deaths which occurred there during the year were the result of pulmonary consumption. Instead of being mild and equable, its climate is irritating and fitful. The overpowering heat of the sun often disguises the dangerous influence of the cold winds. The atmosphere is dry, and, during the prevalence of the mistral, cold and withering; or, when the wind prevails from the seaward, damp and relaxing. Vicissitudes of temperature are sudden and wide; a clear and serene atmosphere with northerly winds is one of low temperature, and this is the prevailing weather of the locality. Nismes is more sheltered than Montpellier, but both are too much exposed for persons of delicate constitution. Autumn is the most agreeable season; and even in winter there are some cases, such as certain forms of asthma and dyspepsia, and those of chronic inflammation of the mucous membrane lining the air-passages, where there is a good deal of [illegible] tion, in which the climate may be tolerated. In[illegible]

the heat and dust make the place insufferable. I once spent a short time there in the month of June, and found it very oppressive. The Pyrenean spas, at no great distance, afford an agreeable retreat during the hot months. The mean annual temperature of Montpellier is 59·91; that of the seasons and months being as follows:—Winter, 44·23; spring, 56·90; summer, 75·95; autumn, 60·95. January, 42·13; February, 44·83; March, 48·88; April, 57·43; May, 64·40; June, 72·50; July, 78·35; August, 77·00; September, 70·25; October, 61·93; November, 50·68; and December, 45·73.

NICE.—The south-eastern boundaries of France have again extended themselves, so as to embrace the long-coveted and oft-contested borderland of Savoy; and they who now invoke the healing powers of a Nissian atmosphere, render themselves no longer amenable to the laws of Italy, but to those of her powerful neighbour. Nice is situated in Lat. 43° 41′ N., and Long. 7° 6′ E., occupying a site remarkable for its mountainous protection towards the interior, whilst, at the same time, it enjoys the advantage of a southern aspect, laved by the waters of the Mediterranean. On his arrival at Nice, an invalid might well exclaim, *Surely I am safe here!* He might naturally suppose, on examining the outline of the surrounding mountains, that he had at length found a place where no evil winds could reach him, and where the vicissitudes of temperature could not be very marked. For a long time Nice enjoyed a reputation such as was likely to accrue from a careless observation of her physical constitution and relations; but the light of experience has gradually dispelled the shades which had previously mantled the insidious onslaught of her morbific agencies, so that in the present day but a comparatively small selection of cases are sent there. The mountains,

forming part of the system of Maritime Alps, which surround Nice, constitute to a considerable extent a barrier against winds blowing from the interior; but they are insufficient when challenged for the protection of consumptive invalids. Winds from various quarters gain access to the devoted valley, either by surmounting the obstacles in their way, or by searching through well-marked breaches in the mountain chain; and having once gained access to it, they sweep along its surface with a destructive vehemence beneath which organised beings of every class shrink in dismay. The north-west wind or *mistral*, so well known in Provence, and in Southern Italy, too, does not pass over Nice without leaving traces of its pernicious effects. Roubaudi characterises it as one of the most vehement of the winds that infest the valley, into which it gains access over the top of the mountain-range, which opposes a too feeble barrier in the way of its approach. It lasts, according to him, sometimes for three, seven, or even nine days at a time, although, on ordinary occasions, it ceases after a duration of twenty-four hours. In point of frequency the mistral ranks high, contesting successfully, in winter, with the north-east, the north-north-west, and north winds; whilst in autumn it assumes an actual preponderance over the other prevailing winds from the north and east. M. Carrière says of the north and north-east winds, so frequent during the cold seasons, that whilst they have not the impetuosity of the mistral, nevertheless they partake of some of its imperfections. The north he characterises as dry and keen, especially in spring. This wind, however, is not so much felt as that from the north-east, for it appears rather to pass over the town, and fall upon the sea at a considerable distance from the shore; the latter is cold and piercing, and falls more directly upon the lower part of [illegible].

Of the easterly winds, Dr Farr, in his work on the climate of Nice, says, "Independently of the *mistral*, from which Nice is more sheltered, from its topographical situation, than many other parts of Provence, the easterly wind sets in with the first moon in March, called by the natives the Blood-red Moon; it is severely felt by the invalid and those in delicate health, and even the strong feel and acknowledge its evil tendency. Last season the number of patients of all nations labouring under affections of the chest might have amounted to thirty; the great majority had greatly improved their state of health up to this period, and they were daily to be seen like butterflies in the sun, riding, driving, and walking over hill and dale. I besought those whom I attended, and many whom I did not, to quit Nice before the birth of this fatal moon; but they heeded not my counsel, and thought I had overrated the danger. They remained; and the day after this easterly wind began, of the thirty I only met one afterwards, and him I had often previously pronounced to have no disease of the lungs." The winds which blow from the southward are generally mild and humid; but the south-west (libeccio) is an exception, being as pernicious at Nice as elsewhere. The south-south-east and analogous winds, M. Roubaudi says, are equally injurious in their effects upon man and plants. They are particularly baneful to persons of delicate constitution and nervous temperament, especially to females and hypochondriacs, in whom they occasion a relaxed state of the system accompanied by a sense of general weariness, loss of energy, and depression of spirits. The sirocco, however, has not the character that it bears in the south of Italy, being much modified by its prolonged journey across the Mediterranean.

The climate of Nice is marked by a dry, irritating atmo-

sphere, which is not at all suitable to persons in whom there is a tendency to inflammatory symptoms of the chest. The temperature is fitful and often extreme in its ranges, especially in the difference between that of day and night. The mean annual temperature, from eighteen years' observation, is 58·90, and that of the seasons as follows: Winter, 46·33; spring, 55·92; summer, 71·83; and autumn, 61·52; the difference between the mean of winter and summer being 25·50; and that between the hottest and coldest month of the year, 29·45. The winds which prevail from sunset to sunrise are those *off the land*, whereas those which occur during the day proceed from the sea; the former are cold and dry, the latter mild and somewhat humid. This alternation of land and sea-breezes is well sustained, and causes marked changes of temperature at the periods of transition, especially when the two classes of winds come into severe collision, or when a third wind is imported into the struggle; and then meteorological phenomena even of an alarming nature sometimes ensue.

The annual fall of rain is estimated at 26 inches, which is precipitated at irregular intervals, sometimes very suddenly, and usually in large quantities at a time. A great deal of rain falls between October and November, leaving the winter and spring months tolerably clear. The Nissians are subject to acute inflammatory affections of the membrane lining the air-passages, as well as to gastric complaints of an irritable character. Although the climate of Nice cannot be recommended in cases where affections of the throat and chest partake of an inflammatory type, or in diseases complicated with gastritic or irritable dyspepsia, nevertheless there are cases of an opposite nature, in which a winter residence there might be prescribed with advantage. Sir James Clark recommends Nice as a resort for

persons afflicted with that kind of chronic bronchial disorder in which there is "copious expectoration," whether complicated with asthma or otherwise. In chronic rheumatism and gout; in scrofulous complaints; in the delicacy of childhood; in dyspeptic cases of a low, nervous, but not inflammatory type; in cases of uterine derangement in early life in which chalybeates are indicated; and in other cases where there are marked symptoms of debility and relaxation proceeding from a long residence in hot countries, he recommends Nice. Whilst residing at Nice, invalids should remember that the warmth which they feel from the direct rays of the sun falling upon them is not really the proper temperature of the atmosphere; so that by passing suddenly from sunshine to shade they proceed as rapidly from a high to a much lower temperature. In taking out-door exercise they should clothe themselves conformably to the indications of a thermometer placed in the external atmosphere, and kept always in the shade; and they should likewise be careful to preserve themselves from the too powerful rays of the sun by means of a light umbrella or parasol. *La Croix de Marbre*, the English *banlieue* of Nice, as is very often the case in winter resorts, is the most objectionable part of the town, exposed as it is to the full force of the mistral and the libeccio. My own personal experience of Nice is confined to that of a short residence in it during spring; but it is quite sufficient to satisfy me that no one need go there in search of health who is not prepared to adhere strictly to a careful regimen; for I can conceive of no place in which the hearty co-operation of the valetudinarian himself is more urgently demanded in order to derive any benefit from a winter's sojourn in it.

PAU—the chief town of the department of the *Basses-Pyrénées*—is situated on the right bank of the *Gave de Pau*,

at a distance of 56 miles east-south-east from Bayonne. It rests upon an eminence forming the right bank of the river, and composed of a light gravelly soil, through which the pluvial waters are permitted to percolate with rapidity. It enjoys an extensive view over a rich tract of land towards the Western Pyrenees, including the lofty summits of *Pic du Midi de Pau* and *Pic du Midi de Bigorre*. Formerly Pau was the capital of the province of *Bearn* and of the little kingdom of Navarre. As the birthplace of Henri IV., of Gaston de Foix, and of General Bernadotte, subsequently king of Sweden, it possesses interesting memoirs. The town lies at a distance of about twenty miles from the Basses-Pyrenees, and at a distance not much exceeding that from the mineral springs ensconced in that extensive chain of mountains. In his account of *Switzerland, the South of France, and the Pyrenees*, Mr Inglis has the following remarks upon the topography of Pau:—"It lies in one of the most beautiful and most abundant countries of Europe, in one of the finest climates; and the city itself is clean, airy, and abounds in every convenience, and in most luxuries. As for the environs of Pau, they are certainly beautiful. The Gave serpentines through the charming undulating country that surrounds the town. Grain, meadows, and vines, diversify the scenery, and innumerable country-houses are everywhere scattered around. Nothing can exceed the beauty of the promenades in the neighbourhood of Pau. Some lie along the side of the Gave, others along the banks of the smaller river; and within the town there is a large and shaded platform which commands a magnificent view over the surrounding country." Since Mr Inglis wrote the above, Pau has undergone a great change. If it was attractive and commodious for visitors then, it is much more so now, and it is quite unnecessary to

there is abundance of excellent accommodation for invalids. Dr Taylor, the talented physician to whose pen we owe so intimate a knowledge of the climate of this interesting locality, has given in his work *On the Climate of Pau* a few useful general instructions to invalids proceeding thither. He recommends them to undertake the journey about the middle of September for several reasons which it is not necessary to reproduce here. I take the liberty, however, of appropriating the following necessary piece of information :—" The Pau season may be said to commence on the 1st of September, and to continue till the 1st of June. This arrangement, of course, is dependent upon three circumstances ; firstly, The state of the weather both at the usual commencement and close of the season ; secondly, The objects which the visitors have in view ; and thirdly, The necessities arising out of their state of health. According to the usual average of the weather, it is not safe for invalids to remain in the higher regions of the Pyrenees after the commencement of September ; nor is the atmosphere always sufficiently settled before the 1st of June, and occasionally not for some weeks afterwards, for a salutary sojourn at Barèges, Cauterets, or even Eaux-Bonnes or Eaux-Chaudes. The summer heat scarcely sets in with intensity at Pau before the middle or end of June ; and there is nothing more to be guarded against by the invalid, anxious to escape from the sameness of Pau's sedative atmosphere, than to be seduced to take up his mountain quarters too soon." Dr Taylor then goes on to relate, that if early application be made for accommodation, apartments of almost any size may be acquired for the winter, at an average cost of from fifteen hundred to nearly five thousand francs, according to size and locality, for the season of eight or nine months.

The climate of Pau belongs to the purely sedative class. Although subject to frequent rains, it would appear, from prolonged observation, that not only does the ground soon dry after a rain-fall, but the atmosphere itself, so to speak, does the same; for it is well known that articles of steel, when exposed during fine weather, do not readily rust; while, on the other hand, a damp towel quickly dries. The annual amount of rain is stated to average about 43 inches, and the number of rainy days in each year about 119. The alternations from clear weather to rainy are rapid, and neither one nor the other kind lasts long at a time. The number of days upon which either rain or snow fell in each month of the year has been given by Dr Taylor in the following numbers as an average of fourteen years:—January, 13; February, 11; March, 13; April, 18; May, 18; June, 16; July, 12; August, 12; September 12; October, 16; November, 12; and December, 11. But in this are included many days on which passing showers fell only, and in other instances the rain fell at night; the day being reckoned, as I understand, one of twenty-four hours. The same authority gives as the mean temperature for the three months of September, October, and November, 56·4; those of December, January, and February, 42·8, as taken from an average of thirteen years; and as the mean temperature of the three months, March, April, and May, on an average of twelve years, 54·00. Snow falls, on an average, during the month of January on 3·2 days, frost occurring during the same time on 8·2; in February on 1·5, frost occurring on 3; in March on 3·2, frost occurring on 4·2; in April on 2, frost occurring on 1; in December on 1, frost occurring on 3. Upon an average of three years the relative frequency of the different winds was as follows:—the N.W. blew on 112·7 days; the W. on 55·3; the N. on 51·7; the

S. on 44·3; the E. on 30·7; the N.E. on 24; the S.E. on 24; and the S.W. on 22·3.

The winds, however, which influence Pau are very different in severity from those passing over Languedoc and Provence; were it not so, an average of 112 days of north-west wind would be ruinous to its character as a winter resort. They are modified by its relative position to the softening influence of the Atlantic on the one hand, and to the circumstance of its being between the cold winds and the mountains. In Florence, Rome, and Naples, for instance, the reverse of this is the case; the dry north winds pass over the snow-clad mountains before reaching them, and are thus increased in severity. The east winds are greatly subdued and softened before reaching Pau. Moreover, the winds generally are rarely vehement; calmness being one of the characteristics of the climate, so much so that occasionally for days together there is no indication of even a zephyr. It is to this absence of violent atmospheric currents that the changes of temperature, from which Pau is by no means exempt, are better borne by invalids. Very low temperatures may be endured in calm weather which would be most destructive if it were accompanied by winds. Sir James Clark, to whose fidelity of description Dr Taylor adds the sanction of his long experience, has the following *resumé* on the climate of Pau:—"Though, from the more frequent occurrence of west winds, this climate may be said to be rainy, still it is not subject to some of the evils which commonly attend humid climates; or at least it suffers from them in a less degree than these generally do. Rain seldom continues above two days at a time, and is usually followed in a few hours by warm sunshine; while the ground, from the absorbing nature of the soil, dries rapidly. The atmosphere, generally speaking, is also re-

markably free from moisture, as indicated by the hygrometer. In October, some snow generally falls on the centre chain of the Pyrenees; and at Pau this fall is marked by a sudden change of temperature, the weather becoming rainy and chilly. In November, the weather clears up and becomes milder. December and January are cold and dry; frost and slight snow-showers then occur, but the snow does not lie on the ground. The sun is bright and warm; and from twelve till three o'clock an invalid may generally take exercise. February is milder; but towards the end of this month the spring rains fall, and the weather is then chilly and disagreeable. March is mild, but variable; though there are no cutting winds. In spring, westerly winds, which are soft and mild, accompanied with rain, alternate with dry easterly winds, also of a mild character. Hence it is that the vernal exacerbation of inflammatory affections of the stomach and lungs, so commonly observed in other climates, is little felt by invalids at Pau. Vegetation bursts forth in the first week of April, which is a warm month. May resembles April, but is warmer. In June the weather is hot and fine. July, August, and September are very hot months, the thermometer sometimes rising as high as 94° in the shade; with a very powerful sun, preventing exercise from eight in the morning until seven in the evening."

The same author quotes the following concise remarks on the climate by Dr Playfair, who resided there for several years :—" Calmness, moderate cold, bright sunshine of considerable power, a dry state of atmosphere and of the soil, and rains of short duration. Against these must be placed changeableness, the fine weather being as short-lived as the bad, rapid variations of temperature within moderate limits. In autumn and spring there are heavy rains."

As a winter resort for invalids, Pau may be recommended to those who require a sedative and somewhat relaxing climate. To those suffering from sub-acute affections of the air-passages, with a dry tickling cough and little or no healthy secretion, it would afford a soothing and beneficial atmosphere. Pau is antagonistic to Nice, and it somewhat resembles Rome in the character of its climate. It is opposite to that of Florence in many points, and in some resembles that of Pisa. In gastritic dyspepsia, and in those forms of disease generally where nervous irritability is combined with an excess of general tone, Pau may be recommended.

I may add the following remarks, which constitute part of one of Dr Taylor's summaries upon the effect of the climate of Pau in health and disease:—"6. Acting on persons in health, the climate brings down the standard of tone, and has a tendency to modify the natural temperament, the sanguine making a move towards the phlegmatic, and the choleric towards the melancholy. On the same principle, no doubt, it is, that diseases of a mixed nervous and inflammatory character come to have their symptoms modified and frequently subdued. 7. That kind of functional derangement of a tonic irritable type, which paves the way to organic mischief, it will be seen from what has been previously said, is the state of things for the alleviation and cure of which the qualities of the climate of Pau are most suited, as well as in preventing the development of pending predispositions to disease, where there is a strong hereditary bias to it. 8. In short, it would seem that the climate of Pau derives a great deal of its value from its neutral properties; from its being neither too hot nor too cold, and from its possessing neither the irritating qualities of a dry climate nor the depressing ones of an atmosphere surcharged with communicable damp, and from its great

exemption from atmospheric agitation." In conclusion, I must again draw upon Sir James Clark's valuable work. I regret that, having neglected an opportunity in 1858, whilst travelling in the region of the Pyrenees, I have not since been able to visit Pau, and cannot, therefore, offer any opinion of my own as to its climate; but I make no doubt the reader will gladly accept the information I have gathered for him, and will, with me, offer his acknowledgments to the authors from whose works it is taken. Speaking of the class of patients to whom Pau is eligible as a winter resort, Sir James says :—"There are several circumstances in the climate of Pau which render it a favourable residence for a certain class of invalids. The atmosphere, when it does not rain, is dry, and the weather fine, and there are neither fogs nor cold piercing winds. The characteristic quality of the climate, however, is the mildness of its spring, and exemption from cold winds. While the *winter* is rather more than 2° colder than the warmest parts of England, and about 5° colder than Rome, the *spring* is nearly 4·5 warmer than the former, and only 2·5 colder than the latter. The mildness of the spring, and its little liability to winds, render this place favourable in diseases of the larynx, trachea, and bronchi. Dr Playfair has found it beneficial in gastritic dyspepsia and some cases of asthma; also in irritation of the trachea and bronchi; but, he adds, it is relaxing, and tone is never acquired there. Hence the change from Pau should be to a bracing climate. With delicate children, also, he found the climate agree well, especially when they removed to the mountains during the summer.

"In bronchial diseases, when accompanied with relaxation of the system, and with copious expectoration and dyspnœa, this climate does not in general prove beneficial;

and Dr Playfair considers it too changeable in consumption.

"Dr Foville, who passed two years at Pau for the benefit of his own health, considers the above account of its climate correct in the main, but in some respects rather too favourable. Its greatest advantage is the constant calmness of the air. He thinks the climate uncongenial to persons with delicate chests. The inhabitants, he says, are generally healthy, and the mortality less than in most cities of France."

The vicinity of the mineral springs of the Pyrenees affords the invalid a double opportunity of restoration. He may proceed either to Pau for his winter's residence first, and subsequently to the baths, or *vice versa*. Or he may spend two winters at Pau and the intervening summer at one or other of the Pyrenean thermal establishments, and thus obtain the benefit of two complete winters without the fatigue of returning to this country. Or, he has another choice; namely, that of spending a part or the whole of the summer at *Biarritz*, where he may enjoy the best of sea-bathing.

VILLA FRANCA.—The bay of *Villefranche* lies immediately to the west of that of Nice, the two places being separated merely by an upland of olive groves, through which a carriage road passes, leaving Nice by the *Piazza Vittorio*. An ascent of 450 feet, to what is called the *Col de Villefranche*, is made in this journey, which occupies not more than two hours and a half altogether. And then leaving the Fort Montalbano on the right, the descent into Villefranche is quickly made. The bay on which Villa Franca is situated is very attractive in point of scenery, as well as in the practical interest which it affords to students of natural history. Geological and zoological specimens of value are

to be obtained from it. Its climate is much like that of Nice, except that it is less exposed to the baneful influence of the Mistral; whilst, on the other hand, it is perhaps more open to some of the easterly winds. The north wind is averted by the neighbouring mountains, and that from the north-east is likewise opposed; so that the position is slightly favoured above that of Nice, and is said to be subject to fewer transitions from heat to cold; a circumstance which is evidenced by the earliness, luxuriance, and delicacy of its vegetation. Orange, lemon, and carouba trees are profusely scattered in the the neighbourhood, which shows an almost total absence of frost.

CHAPTER XI.

FRANCE : SUMMER RESORTS.

HAVING considered the winter resorts of the south of France, it remains for me to touch lightly upon such other places, distributed throughout the same country, as are usually frequented by invalids during the warmer months of the year. And in doing so I shall not deem it necessary to go beyond a simple reference, in brief terms, to the peculiar circumstance, generally the possession of a mineral spring, which attracts visitors to the several places hereafter following in alphabetical order. But let me first premise a few general remarks upon that region in which the mineral springs of France are most numerous—I mean

The PYRENEES.—Next in order to the Alps amongst European mountains, at least in point of general elevation, is to be ranked that stupendous chain which, from its north-north-eastern extremity, where it dips into the Mediterranean at Cape Creux, to its south-south-western termination, where it is lost in the Cantabrian Mountains, constitutes the well-defined frontier line of France and Spain. The extent of the Pyrenees between the points already named is about two hundred and seventy miles, whilst the distance between the lowlands of France and those of Spain ranges from fifty

to a hundred. The mean altitude of these mountains is 7990 feet, and the loftiest summits are those of *Pic Nethou* (Maladetta), 11,168 feet; *Mont Perdu*, 10,994 feet; the *Vignemale*, 10,820 feet; *Pic du Midi*, 9540 feet; and *Le Canigou*, 9137 feet. The Pyrenean Mountains, like the Alps, rest upon rocks of primary formation, but the extent of this system in the former is less than in the latter, and consists of granite, mica-schist, and primitive limestone. The rest of the mass is composed chiefly of secondary rocks, including clay-slate, grauwacké, and blue limestone. The aspect of the Pyrenees presented towards the south of France is of a much more inviting description than that overlooking the north of Spain. The former has a comparatively gradual slope, and is clothed with sylvan verdure almost to the very summits; whilst the latter is more abrupt, frowning, and barren. Unlike the Alps, whose loftier summits are buried in eternal snow, and whose less aspiring peaks are clothed with little else than the very shreds and fringes of the vegetable world, the Pyrenees are clad with forests of beeches, oaks, and firs, which sweep in waving splendour along their acclivities from the pasturage of the valleys to the mountain tops. It is to their more southern position that the Pyrenees owe the superior advantages already remarked, as well as that of being able to rear a harvest of maize and hay at an elevation of 3000 feet above the level of the sea. But there is a point of altitude, even in the Pyrenees, beyond which life is unknown, unless it be in the shape of an excursive *lynx*, whose habitation lies in the vicinity of perpetual snow, and a little above that of his less agile friend the bear. The snow-line occurs at an elevation of 8000 feet.

Communication between France and Spain is effected by means of passes in the mountains, which reach an

elevation varying from 7000 to 9000 feet. Of these there are about fifty, few of them, however, being available for carriages. The *Col de Pertus* is open at all seasons; it is on the line between *Perpignan* and *Jonquera;* besides this, the pass of *Puymoriens,* conducting from the valley of *Ariège* to that of *Segre;* the *Port de Confranc,* on the route between *Pau* and *Zaragoza;* the *Port de Roncevaux* connecting *San Jean* and *Pamplona;* and the pass of *Bidassao,* over which lies the road from *Bayonne* to *Vitoria,* are all available for carriage traffic. The northern slopes of the Pyrenees, and it is in them that we are more particularly interested, send forth spinous ridges, not unlike those on the corresponding aspect of the Lesser Atlas chain, towards the interior of France. Between these spurs or offshoots are ensconced the beautiful valleys containing the far-famed mineral springs, and in whose depths rush down the impetuous mountain streams, termed, in the vernacular, *Gaves.* The largest of the valleys are those of the *Garonne* and the *Ariège;* but there are others more picturesque, particularly those of *Argelez, Ossau, Adour, Arrau, Lez,* and *Aure.*

The climate of the Pyrenees is precisely such as might be inferred from their latitude, longitude, relation to neighbouring seas, and varying elevation. The atmosphere is generally balmy and agreeable, and in summer and autumn —at which seasons this locality is resorted to by invalids— it is cool and refreshing. As the invalid passes homewards from his winter quarters, he may with advantage add to the benefits already acquired by a judicious course of the mineral waters at one or other of the Pyrenean spas. Or, if he be intent upon passing a second winter in the south, he may spend the intervening months at one of these places, and so avoid the fatigue and expense of a longer journey.

He should bear in mind, however, that in all mountainous countries, and especially within the grasp of the mountains themselves, the temperature of the atmosphere is subject to sudden and wide vicissitudes; that mounting from a valley where the sun's rays are striking with their utmost force, by the acclivity of a mountain protected from the solar influence, is simply exposing himself to imminent peril; and, moreover, that at all times he should be stoutly clad, if he would preserve himself from the noxious effects of transitions of temperature, whether at intervals during the day, or that which invariably occurs so soon as the sun reaches the horizon. It will be obvious, likewise, that the western extremity of the chain, being nearer the vast extent of Atlantic Ocean, will have an atmosphere more moist and relaxing than that impending over the central or eastern parts, where this circumstance is less powerfully experienced.

There is, perhaps, no place so munificently endowed with mineral springs as that comprised within the northern offshoots of the Pyrenees. Nor is it the present age only that is favoured with so great a profusion of ready made warm baths. The Romans knew their value, and dedicated them *Deo Lixoni*, as is proven by the numerous relics of their idolatrous temples which have been rescued from the *debris* of their costly edifices. The water yielded by these springs is generally of elevated temperature, and more or less impregnated with sulphur; that from some sources being saline, or ferruginous, or both, and that from others a complication of the whole. Of springs essentially sulphurous we have examples in those of Bagnères-de-Luchon; Saint-Sauveur; Cauterets and Barèges. Bagnères-de-Bigorre, and several others, are examples of thermal-saline springs; whilst an occasional cold ferruginous spring is met with, as

at Castera-Verduzan, Casteljaloux, and elsewhere. The sulphurous springs make their escape usually from the base of the mountains near the granite foundation, or between it and the micaceous-schist. They are by far the more numerous of the Pyrenean springs, the other kinds having rather the appearance of *accidental* interposition than that of a proper *locus standi* in the district. All the sulphurous springs contain pretty much the same mineralising principles in kind, but to a different degree. Of these the more prominent are, sulphuretted hydrogen, hydrosulphate, sulphate, and carbonate of soda, chloride of sodium, salts of lime, magnesia, and silica, and, finally, two substances peculiar to them, and which have received the names of *Glairine*, or *Barègine*, and *Sulfuraire*. The former of these two latter ingredients—the *Glairine* or *Barègine*—is a substance of gelatinous consistence and amorphous construction; its colour varies from reddish or greenish white to black; in its chemical reactions it behaves after the manner of animal matter. This substance, whose exact office has not been correctly ascertained, is peculiar to sulphurous waters generally and not to those of the Pyrenees in particular. The second substance above mentioned, the *Sulfuraire*, as M. Fontan has named it, is a whitish flocculent matter, perhaps of vegetable origin, and belonging to the Confervæ. In one or two of the springs, moreover, there are traces of iodine. The ferruginous springs flow from a loftier source than those containing sulphur, and are invariably cold. The iron of their constitution is in the form of protocarbonate; it is readily decomposed, and then deposits the reddish brown oxide, leaving the water free from its chalybeate effects. These waters contain likewise earthy salts of various kinds, and are more or less charged with free carbonic acid gas. Of the saline springs some are pur-

gative, others not so; they contain in diverse quantities the sulphates of lime, soda, and magnesia, and occasionally that of alumina, as well as the chlorides of calcium, sodium, and magnesium, together with the alkaline carbonates and a variable amount of organic and bituminous substances. In addition to the ordinary baths, there is one kind much employed at certain of the spas where the water permits of it. It is the *mineral mud bath*, and is made of the mud-like deposit which is precipitated by some of the springs; such, for instance, as those of Barbotan. From the miry medium which adheres to him after a bath of this kind the patient is cleansed by a wash in one of the thermal baths. Of the particular maladies in the cure of which the various springs of the Pyrenees are available, a succinct account is given after the description of each spa, and will be found by referring to the name of the place which the invalid desires, or may have been directed to visit. In concluding these cursory remarks it is necessary only to add further, that the waters ought on no account to be taken without proper counsel, either before leaving home, if his medical adviser be conversant with the peculiarities of the baths which he is about to try, or, what is far better, after his arrival at the spot, and at the hands of a physician whose experience of the therapeutic effects of the waters enables him to pronounce decisively on the influence which they will be likely to produce upon a constitution such as the invalid presents. Attached to each of the Pyrenean bathing establishments there is a *Government inspector;* that is, a physician employed by the authorities to overlook and control the working of the baths. He will, on application, afford the invalid all necessary information, and will, moreover, regulate the time of his baths, a matter of no small importance during the height of the season, when otherwise he might have to wait

long enough for *a turn*. An injudicious selection of a spring might lead to hazardous consequences, hence it behoves the invalid to use all precautionary measures. It will be the duty of the physician there to regulate the time, number, and duration of the baths, the temperature at which they should be taken, and the kind of bath to be employed. He will recommend a suitable diet, and a fitting amount of exercise; and for his lady patients he will direct certain precautions which it would be dangerous to neglect. The Pyrenean spas may be approached from Bayonne, Tarbes, Toulouse, or Perpignan, to which places the most convenient routes are those by the various railroads from Paris to the south of France; unless the invalid be returning from a southern climate, when, of course, an opposite direction will be open to him. Invalids who have wintered at Pau will have ample opportunity for studying the topography of the Pyrenees before proceeding to take up their summer quarters in the mountains. The season generally extends from the middle of May to the middle or end of September; in some, however, it does not commence until June, whilst in one or two it is perennial. The accommodation for visitors at the Pyrenean spas is decidedly inferior to that of the baths of Germany; nevertheless it is tolerably good. Festivities, balls, and gambling, are the exceptions rather than the rule of practice at these watering places. Out-door exercise may be taken in abundance in scenery of the choicest description. Students of natural history will find innumerable objects to engage their attention. Sportsmen may angle in prolific streams, or chase the bear into his lofty habitat. In short, all who are willing to be satisfied will meet with food for the mind as well as restoratives for the body in the luxuriant valleys of the Pyrenees.

Aix (*Aquæ Sextiæ*).—A city of the department *Bouches-*

du-Rhone, in the south of France, is situated in a plain seventeen miles to the north of Marseilles. It contains a population of 28,000; and is well constructed. The old Roman saline spring is still in operation, and is surrounded by relics of the grandeur which in its day was heaped upon it. The waters contain as their chief saline ingredient a considerable quantity of carbonate of soda; they are rarely used medicinally. The temperature varies between 93·20 and 96·80.

Aix (*Savoy*).—The *Aquæ Gratianæ* of bygone days, is situated in a beautiful valley near to Lake Bourget. The scenery in the neighbourhood of the little town is marked by a cheerful variety of mountains, woods, and water, and affords opportunities for an abundance of out-door exercise and amusement. Aix is much frequented during the summer months as a cool retreat from the fervent heat of the southern parts of Italy, and is visited by many invalids, who, having spent the previous winter in Italy, are desirous of remaining through the subsequent one likewise without having to encounter the fatigue of a long and expensive journey to the north during the intervening months. The climate of Aix, in the warm season, is not so oppressive as is generally supposed, being subject to cool and refreshing breezes. Dr Francis, who spent a summer there, mentions it in his excellent work on climate, in terms of commendation. "The summers," he says, "are exceedingly temperate; more so even than those of the romantically situate baths of Courmayeur, at the foot of Mont Blanc, which are by far the coolest of the habitable places of resort that I have met with on the Italian side of the Alps. During the summer of 1851, which I spent at Aix, the thermometer in the shade seldom rose higher indoors than 73°; I never saw it above 75°. The mornings and evenings were

always cool. The chief drawback was rain, which sometimes lasted for two days incessantly. When the rain was over, however, the air and the walks, as in most limestone countries, soon became dry. As in all mountain situations, there were occasionally cold and windy days in the hottest months; and towards the end of August the fall of temperature became very sudden. The air is healthy, bracing, and free from irritating properties." Aix may be reached from this side by the Lyons railway, on the route of *Maçon* and *Culoz*, in about fifteen hours from Paris. There is excellent accommodation for visitors, and a variety of entertainment is provided for them. Unfortunately the vice of gambling is in vogue at Aix to almost as ruinous an extent as in many of the German watering places. I need hardly say that the effects of an occupation at once so exciting and degrading is as prejudicial to the welfare of the body as it is destructive of that serenity of mind which forms the keystone of the fabric upon which health is constructed. No amount of medical treatment can counterpoise the evil influence which this pernicious habit is wont to exercise upon the entire human organism. The springs of Aix are two in number, named respectively *Soufre* and *Alun*. They are both collected into one large bathing establishment; and, at the place where they are made use of, have a temperature varying between 114·80 and 116·60. The waters are limpid, and impart the disagreeable odour of sulphuretted hydrogen. They are but slightly impregnated with mineralising principles, so that it is to their high temperature, and perhaps to a small quantity of iodine, that their therapeutic effects must be attributed. They are employed both externally and (occasionally) internally; but chiefly in the form of the douche, in cases of chronic rheumatism, both muscular and articular; in some

forms of cutaneous affections, particularly of the pustular variety; in sciatica; in the treatment of old wounds; and in certain kinds of chronic paralysis in which no active symptoms are present. Like other mineral waters of high temperature, whose effects are to cause increased skin action, and to give a fillip to the circulatory apparatus, those of Aix are contra-indicated in persons of plethoric constitution, or wherever there is organic disease of the heart, as well as in some cases where there is great prostration and general debility. Mud baths are used at Aix, especially in the treatment of old injuries, in which an impediment to the use of one or other of the limbs remains—as in imperfectly healed fractures or dislocations, followed by false anchylosis, and such like, and especially in painful cicatrices following injuries from fire-arms.

ALET—a village of the maritime department of *Aude*, in the south of France, is situated in a valley not far distant from *Carcassonne*. It possesses springs which yield a tepid and but slightly mineralised water, which, however, is used by the neighbouring inhabitants with reputed benefit in certain forms of irritable dyspepsia. Its chief ingredients are the salts of lime, with a slight effervescence of carbonic acid gas.

ALLEVARD—a town of the department of *Isère*, is the chief town of the canton, and rests upon the left bank of the river *Ozeins*, at a distance of twenty-three miles to the north-east of Grenoble. It possesses a mineral spring, whose waters are raised by means of pumps to a required elevation. By this process the waters are much altered in character before arriving at the establishment in which they are medicinally employed. They are impregnated with sulphuretted hydrogen and carbonic acid gases.

AMAND-LES-EAUX, (St.)—*Amandapolis*, a town of the

department *Nord*, lies on the left bank of the *Scarpe*, at a distance of six miles north-north-west from Valenciennes. It is visited for the sake of its *mud* baths. It possesses, however, four sulpho-thermal springs, but they are little used. The mud, into which bathers plunge themselves pretty freely, consists, in a hundred parts, of ninety parts of silica, and ten made up of carbonate of lime, peroxide of iron, alumina, carbonate of magnesia and oxide of manganese. It is strongly impregnated with carbonic acid and sulphuretted hydrogen gases. The space containing the semi-liquid earth is divided into about eighty small private baths, each of which is constantly renewed by the unceasing flow of the mineral springs that liquify the substance. The natural temperature of the bath does not exceed 75·20; but it is raised to a higher degree by the aid of artificial heat. These baths are employed in atrophy of the limbs; muscular contractions; sprains and stiffness of the joints; in certain forms of paralysis; and in chronic rheumatism.

ARLES-SUR-TECH (*Arles-les-Bains: Amélie-les-Bains*)—a village in the *Pyrénées Orientales*, is situated, as its name implies, on the banks of the river *Tech*, at the foot of Mount Canigou, at a distance of twenty miles south-west from Perpignan, and at an elevation of nine hundred feet above the level of the sea. The climate of Arles is mild and equable, so that the baths are frequented throughout the year. The mean annual and seasonal temperature of Arles, the capital of the canton, and from which Arles-sur-Tech is only two and a half miles distant, is as follows:—Annual, 58·46; winter, 41·68; spring, 57·27; summer, 74·98; autumn, 59·90. The scenery in the neighbourhood of the baths is very fine, and affords opportunities for many agreeable excursions. There are several springs at Arles, mostly alike in physical as well as chemical properties at their

source, although they differ by reason of a partial decomposition at the places where they are made use of. Their temperature varies between 109·80 (*La Source Manjolet*) and 144·50 (*Le Petit Escaldadon*). The springs are collected into two private bathing establishments (the one belonging to Dr Hermabessière, and bearing his name; the other, the property of, and named after, Dr Pujade), and a military establishment, used by the Government as a sanitarium for invalid officers and soldiers. The waters are recommended in chronic rheumatism; in genito-urinary affections in both sexes; in derangement of the uterine functions; in scrofulous enlargements, and in strumous cachexia generally; in chronic affections of the lining membrane of the air passages; in indolent cicatrices of wounds, especially those by fire-arms; and in advanced and obstinate cases of syphilis. They are likewise much employed in certain forms of dyspepsia, in some obstinate cutaneous affections, and as deobstruents in engorgement of the abdominal viscera. They are contra-indicated in acute inflammatory diseases, and in cases of plethoric temperament. As an average of the whole, the analysis of M. Anglada may be given. He found in a quart of the waters of the *Gros Escaldadon* the following amount of mineral ingredients:—

Glairine,	0·154
Hydrosulphate of soda,	0·602
Carbonate of soda,	1·158
Carbonate of potash,	0·030
Chloride of sodium,	0·633
Sulphate of soda,	0·649
Silica,	1·391
Carbonate of lime,	0·005
Sulphate of lime,	0·004
Carbonate of magnesia,	a trace
Total in grains,	4·626

The ferruginous springs at *Saint-Martin-de-Fenouilla*, and those of Boulou, both in the vicinity of Arles, are frequently employed in conjunction with the waters of this place.

AUDINAC.—The baths of Audinac, in the department of *Ariège*, in the south of France, lie about five miles to the south of Saint-Girons. The climate is mild, and the surrounding scenery attractive, and at the bathing establishment itself there are comfortable apartments for invalids. The season extends from June to September inclusive. The springs of Audinac are two in number, but only one of these is employed in the form of baths, the other being used exclusively as an internal remedy. These springs yield a large quantity of clear, limpid, and inodorous fluid, of an unpleasantly harsh and somewhat styptic taste, and of an unvarying temperature of 69·80. The waters act as diuretics, purgatives, and emmenagogues, and are employed to dissipate engorgements of the abdominal viscera; in certain forms of dyspepsia, accompanied by loss of appetite and flatulence; and in disorders of the genito-urinary system, more especially in mal-performance of the uterine functions. Also, on account of their tonic properties, they are recommended in cases of relaxed fibre generally. Besides a small quantity of carbonic acid, oxygen, and nitrogen, or azotic gases, a quart of the water contains, according to M. Magne-Lahens, the following solid ingredients:—Sulphate of lime, 10·976; sulphate of magnesia, 9·739; chloride of magnesium, 5·391; carbonate of lime, 8·074; carbonate of iron, 1·096; bitumen, 0·972. Total in grains, 36·248.

AULUS—a village in the department of *Ariège*, in the south of France, is situated in a deep valley, traversed by the rivulet of *Garbet*, and surrounded by lofty mountains clad in alpine vegetation. The village is very near to the

Spanish frontier, and the spring which has been the means of bringing it into notice makes its escape on the left bank of the Garbet, at the foot of Mount *las Costos*. The road to Aulus from Saint-Girons (distant about twenty miles) is not a convenient one, and the accommodation offered to visitors in the neighbourhood is not very extensive. The water is colourless and limpid, somewhat unctuous to the touch, without any disagreeable odour, and of a slightly bitterish taste. Its temperature never varies from that of 68·00. It is slightly tonic, diuretic, and purgative in its medicinal action, and is recommended as a deobstruent in congestion of the abdominal viscera; in urinary concretions; in chlorosis, anœmia, and in cases requiring the use of emmenagogues. It has also a reputation for the cure of obstinate cases of advanced syphilis. Besides a little carbonic acid gas, it contains the chlorides of calcium and sodium; the sulphates of lime, magnesia, and soda; the carbonates of lime and magnesia; a small quantity of the oxide of iron, together with traces of copper, arsenic, and manganese.

AUTEUIL.—This little village, close to Paris, and still nearer the *Bois de Boulogne*, possesses a cold chalybeate spring, whose water is made use of both at the spring itself, above the village, and in Paris, where it is sold in bottles. Its ferruginous principle is that of the sulphate of iron in combination with the sulphate of alumina. It likewise contains traces of a salt of manganese. The waters are employed for their tonic effects in cases where a want of blood corpuscles is indicated, with a generally relaxed system.

AVÈNE—a village of the department of *Herault*, in the south of France, is about ten miles from *Bédarieux*. It has a mineral spring, whose waters contain salts of soda, lime, and magnesia in small quantities, and escape at a temperature of 82·40. It is employed both internally and

externally in chronic rheumatism and cutaneous affections in persons of irritable dispositions, upon whom the stronger waters exercise a prejudicial effect. *Avène* is chiefly resorted to by the inhabitants of the neighbouring country.

Ax—a small town, and capital of a canton, in the department of *Ariége*, in the south of France, is built upon the right bank of the river Ariège, at a distance of twenty-two miles to the south-east of Foix, and at an elevation of 2300 feet above the level of the sea. The town, consisting almost entirely of a single street, offers tolerably good accommodation for invalids, and is surrounded by picturesque scenery, to different parts of which agreeable excursions may be made. The mineral springs of Ax are of higher temperature than most of those in the Pyrenees, and are very numerous; only a few of them, however, are employed medicinally. The lowest temperature is observable in the waters of *La Canalette* (77·00), and the highest in those of *Rossignol Supérieur* (170·60), the average being 126·50. The waters generally are clear and limpid, having an unctuous feeling and a disagreeable sulphurous odour and taste. Although the bathing accommodation is inferior to that of many other of the Pyrenean spas, Ax is nevertheless a good deal resorted to. In chronic rheumatism, obstinate chronic cutaneous affections; in scrofulous enlargements; the sequelæ of wounds, especially those by fire-arms, and in indolent ulcers, these waters are recommended. They are also employed as deobstruents in engorgement of the abdominal viscera, in certain forms of paralysis, and in certain uterine affections, of which leucorrhœa is the type. They are not adapted to affections of the chest, nor to maladies of a low nervous hypochondriacal character. Invalids should not resort thither before the first of June, nor remain after the twentieth of September. According to an

analysis by M. Magne-Lahens, a quart of the water of the Tech spring contains the following ingredients, besides indications of the presence of sulphuretted hydrogen:—Chloride of sodium, 0·247; carbonate of soda, 1·685; azotised organic matter, 0·077; silica in solution, 1·685; free silica, 0·771; carbonate of lime, 0·092; iron and alumina, 0·061; magnesia, traces. Total in grains, 4·618.

BAGNÈRES-DE-BIGORRE (Aquensis Vicus)—a town in the department of the *Hautes-Pyrénées*, south of France, is situated on the left bank of the *Adour*, near the entrance of the valley of *Campan*, at a distance of thirteen miles south-south-east from *Tarbes*, and at an elevation of upwards of 1900 feet above the level of the sea. The situation of Bigorre, amidst variegated and fascinating scenery, and its climate, soft and equable, together with the accustomed gaiety of the place, invest it with attractions which procure for it annually a large afflux of visitors. The accommodation for strangers is ample and comfortable, and whilst the domestic arrangements are unexceptionable for a summer watering place, the numerous excursions that may be made in the vicinity, add a new importance to the situation as a resting-place for invalids, who require physical as well as mental occupation. The season extends, with more or less briskness, over the whole year, and at various times the baths are visited by large numbers, many of whom desire rather relaxation and enjoyment, than the medical interference of the waters which they outwardly profess to seek. The mineral springs of Bigorre are very numerous, and the establishments for their employment are the finest in the Pyrenees, especially that called *Marie-Thérèse*, constructed in Pyrenean marble. This establishment contains seven springs, of a temperature ranging from 86·00 to 119·30. Besides this, there are many smaller

and private baths. The waters are generally employed in cases where long attention to business, protracted and severe studies, or other debilitating influences, have been acting upon the physical and mental constitution, and have reduced it to a condition of utter weakness, without producing any absolute organic disease. And in such cases the excitement and gaiety which prevail at Bigorre add not a little to the restoration of health. To persons of low nervous energies, and of hypochondriacal disposition, this place is commendable above any other of the Pyrenean spas. On account of their high temperature, the waters are used, moreover, in chronic diseases of various kinds, especially those of the skin and rheumatism. On account of their saline and purging influence, they are recommended as deobstruents in engorgements of the abdominal viscera; and finally, on account of their ferruginous properties, they are employed in general relaxation of the system, and particularly in the nervous diseases incident to females, and in functional disorders of the uterine system. The waters appear originally to emanate from but one reservoir, and have throughout nearly the same physical and chemical constitution. They are all clear, limpid, and nearly inodorous. The springs of *Pinac* contain one that is accidentally sulphurous, and which makes its escape at a temperature of only 68·00. Another spring, issuing from the side of *Mont Olivet*, supplies cold water; it is called *La fontaine ferrugineuse.*

According to analyses by MM. Ganderox and Rosière, three of the springs of Bagnères-de-Bigorre yield, from a quart of the water of each, the following mineral ingredients, in addition to a small quantity of carbonic acid gas:—

	Source de la Reine.	Bains de Santé.	Bains de Pinac.
Chloride of magnesium,	2·011	3·252	3·815
Chloride of sodium,	0·957	1·158	2·920
Sulphate of lime,	25·935	7·780	21·551
Sulphate of soda, / Sulphate of magnesia,	6·114	6·114	4·431
Carbonate of lime,	4·106	3·995	6·731
Carbonate of magnesia,	0.680	0·910	1·174
Carbonate of iron,	1·236	...	0·926
Fatty matter,	0·092	0·123	0·123
Extractive,	0·092	0·123	0·154
Silica,	0·555	0·463	0·664
Loss,	0·833	0·448	0·695
Total in grains,	42·611	24·366	43·184

BAGNÈRES-DE-LUCHON (*Balnearia Luxoniensia*)—a small town in the department of the *Haute-Garonne,* and chief town of the Canton—lies in one of the most fertile valleys of the Pyrenees, on the banks of the *Gave de la Pique,* near the Spanish frontier, twenty-two miles south-south-west from St Gaudens, and at an elevation of 2000 feet above the level of the sea.

The springs of Luchon were highly esteemed by the Romans, who erected baths there, and dedicated them *Deo Lixoni.* Many relics of Roman architecture have been discovered, and may now be seen in the museum of Toulouse. In the middle ages Luchon fell into neglect, from which it has of late years revived, and is now resorted to by an average of 8000 annual visitants. There is good accommodation at Luchon for invalids, and the town itself, as well as the surrounding country, affords ample opportunity for out-door exercise, combined with agreeable scenery. The excursions which may be made to places in the vicinity of Bagnères-de-Luchon, are among the finest in the Pyrenees.

The springs are many in number, all of which make their escape from the foot of the mountain, named, in consequence, *Superbagnères*. The water issuing from them is a colourless limpid fluid, saponaceous to the touch, and of a disagreeable sulphurous odour and taste. It contains a light flocculent substance resembling the scrapings of fine lint, and deposits along its course a certain quantity of sulphur. By a judicious combination of the water from springs of different temperature and chemical constitution, an almost infinite variety of baths are employed in the treatment of diseases. The waters are likewise administered internally. They are employed in the treatment of obstinate cutaneous affections; in cases of wounds by fire-arms, as well as in the sequelæ of fractures and dislocations, especially in pseudo-anchylosis; in cases of chronic rheumatism with arthritic deposits; in indolent ulcers, and in chronic diseases of the nervous system. They are likewise used with success in chronic affections of the lining membrane of the air-passages, and as deobstruents in engorgement of the abdominal viscera; and also in certain nervous complaints, the consequence of derangement of the uterine system. In the latter cases, however, they should be used with great caution, as well as in others marked by nervous and irritable temperaments, or where the system has been much exhausted by previous disease. They are contra-indicated in persons of sanguine temperament, especially where there is any tendency to organic disease of the heart; in advanced phthisis, and in all acute inflammatory disorders. The season at Bagnères-de-Luchon extends from the middle of May to the same period in October. According to an analysis by M. Filhol, the following ingredients are found in a quart of the water:—Sulphuret of sodium, 0·478; sulphuret of iron, 0·030; sulphuret of manganese,

0·015; chloride of sodium, 1·112; sulphate of potash, 0·077; sulphate of soda, 1·050; sulphate of lime, 0·618; silicate of soda, 0·139; silicate of lime, 0·571; silicate of magnesia, 0·077; silicate of alumina, 0·015; free silica, 0·154; total in grains, 4·336.

The different springs vary a little in their chemical constitution, and likewise in temperature, the lowest of which is that of *Froide Saline*, 60·80; and the highest that of *Bayen*, 154·40. The average temperature of the whole springs is 106·50.

BAGNOLES—is situated in an agreeable valley on the borders between *Maine* and *Normandy*. *Couterne*, at a distance of two and a half miles, is the nearest town to the springs. These are three in number, and yield a limpid and somewhat unctuous water, having a slightly sulphurous odour, and a temperature of 80·60. They are employed as sulpho-thermal springs by those in the neighbourhood.

BAGNOLS—a village of the department of *Lozère* is situated about fifteen miles from *Mende*. It possesses thermo-sulphurous springs which had a reputation amongst the Romans. The temperature of the water is 113·00.

BAINS—a small town in the department of Vosges, is situated thirteen miles south-west from Epinal, and is reached by the railway to Mulhouse as far as *Saint-Loup*, and thence by carriage, which occupies an hour and a half more. There are a great many mineral springs at Bains; but only two, named respectively *La Grosse* and *La Tiède*, are employed medicinally; the former of which has a temperature of 122·00 whilst that of the latter does not exceed 91·40. The springs are collected into two thermal establishments, named *La Bain Romain* and *La Bain de la Promenade*. The waters are but slightly impregnated with mineralising principles, the chief constituents being the

alkaline carbonates, with small quantities of the sulphate of soda and the chloride of sodium. They are employed chiefly in the form of baths; and in the large ones *both sexes are admitted at the same time.* They are supposed to be calmative in their effects, and to be efficacious in the cure of chronic maladies, especially those to which females are liable. The waters are likewise administered internally, and have a slightly constipating tendency. The season extends from 15th May to 15th September.

BALARUC—a village of the department of *Herault* in the south of France—lies at about an hour's drive from Cette, on the border of a little lake which communicates with the sea. The spring of Balaruc belongs to the class of *sulpho-thermals.* Its waters contain the chlorides and bromides of sodium and magnesium, together with the sulphate of lime, and, from time to time, an admixture of free carbonic acid gas; with a temperature of 118·40. They were formerly used in a very mischievous manner as a cure for apoplexy; but the light of science has dawned upon a proceeding at once dangerous and absurd, and at the present time they are recommended only in those cases to which their elevated temperature is likely to be advantageous. The accommodation afforded to visitors is very poor, and in summer the excessive heat renders a residence at the baths intolerable.

BARBAZAN—a village in the department of *Haute-Garonne,* south of France—is situated on the right bank of the Garonne at a distance of nine miles from Saint-Gaudens. The mineral spring of Barbazan yields an inodorous, limpid fluid, at a temperature of 66·20. It is administered, in a small building, in cases of engorgement of the abdominal viscera; in chronic rheumatism, obstinate intermitting fever, and in chronic affections of the genito-urinary system.

A quart of the water yields, on analysis, 26·242 cubic

inches of carbonic acid gas; 23·157 grains of sulphate of lime; 4·757 grains of the sulphate of magnesia; 0·277 of a grain of the sulphate of soda; 2·011 grains of the carbonate of lime; 0·817 of a grain of the carbonate of magnesia; 0·139 of a grain of the chloride of sodium; 0·015 of a grain of the oxide of iron; 0·216 of a grain of silica; besides traces of the chlorides of calcium and magnesium, as well as of alumina and iodine.

BARBOTAN—a village on the borders of the department of *Gers* and *Landes*, in the south of France—is situated near Cazauban, and within easy travelling distance of *Mont-de-Marsan*, *Agen*, *Nérac*, &c. Barbotan contains several mineral springs, which yield a transparent, limpid fluid, charged with carbonic acid gas, and of a temperature ranging between 78·80 and 100·40. The season extends from June to September inclusive. The waters are recommended in cases marked by relaxed fibre generally, to which they impart tonicity; they are, moreover, employed as deobstruents, and in chronic affections of the genito-urinary system. For these maladies the waters are administered in medicinal potions. But in the form of baths, especially in the *mud-bath* made from the deposit of the water, they are said to be serviceable in chronic rheumatism, and diseases of the skin; in sprains, pseudo-anchylosis, and a variety of injuries, in indolent ulcers, &c. They are contra-indicated in organic disease of the heart, in plethora, and, as baths, in visceral congestion generally. The water is slightly impregnated with sulphuretted hydrogen and carbonic acid gases; and contains, moreover, the carbonates of lime, magnesia, and iron; the sulphate of soda, chloride of sodium and silica.

BARÈGES—a village of the *Hautes-Pyrénées*, rests in a deep and narrow valley, formed by the Bastan, on whose left bank it lies, at a distance of about thirty miles from

Tarbes, and at an elevation of 4000 feet above the level of the sea. Barèges is the highest of the Pyrenean spas, and is surrounded by steep and barren mountains, whence avalanches descend in winter and spring, frequently to the destruction of a portion of the village. The place affords tolerably good accommodation for invalids in summer, partly in houses built of stone, and partly in wooden edifices, erected in the month of May, and taken down again at the end of September, when the season is over. There is nothing in the situation of Barèges to recommend it as a resort for invalids, even in the height of summer, and in winter it would be entirely deserted but for the few hardy *Montagnards* who remain to take care of the houses and bathing establishments. But its waters have been long in great reputation, and have acquired for it, in spite of its barren and uninviting aspect, a large annual afflux of visitors. There is a military sanitarium near the mineral springs, capable of affording accommodation to from three to four hundred officers and soldiers. The thermo-mineral springs are nine in number, named as follows, in the increasing order of their temperature:—*Barzun*, 86·00; *La Chapelle*, 87·80; *Genecy*, 91·40; *Dassieu*, 93·20; *Le Fond*, 96·80; *Bain Neuf*, 98·60; *Polard*, 98·60; *L'Entrée*, 102·20; *Le Tambour*, 111·20. The water is clear, limpid, and unctuous to the touch, and has a disagreeable odour and taste. It deposits a considerable amount of pseudo-organic matter, to which the name of *Barégine* has been applied. The waters of Barèges, although escaping by the several different outlets above mentioned, probably originally proceed from a common source; at all events, their physical and chemical properties are very nearly uniform throughout. M. Lonchamp found in a quart of the water the following ingredients:—

SOLID.	
Sulphate of sodium, ...	0·649
Sulphuret of sodium, ...	0·771
Chloride of sodium, ...	0·618
Silica, ...	1·034
Lime, ...	0·030
Magnesia, ...	0·005
Caustic soda, ...	0·077
Caustic potash, Ammonia, Barégine, ...	traces
Total in grains, .	3·184
GASEOUS.	
Nitrogen or azote (cubic inch), . . .	0·244

The waters of Baréges are stimulating, and tonic in their effects, and should be employed with caution, under the guidance of a competent resident physician. Their efficacy is manifested more powerfully in protracted chronic diseases, especially in old wounds received in battle, to the cicatrices of which they give a healthy impulse, and tend to facilitate the dislodgement of foreign bodies, such as bullets and the like. Obstinate cutaneous affections, where there are no inflammatory symptoms, indolent ulcers, caries, necrosis, as well as other chronic diseases of the bones, are cases in which these waters are recommended. In advanced cases of syphilisation, or of mercurialisation resulting from the treatment of the former, the waters are likewise beneficial; and also in chronic rheumatism. They are contra-indicated in inflammatory diseases, organic affections of heart, gout, paralysis, asthma, chlorosis, and in uterine diseases generally. Persons of full habit of body, as well as those of weak and irritable constitutions, including phthisical patients, ought not to resort to Baréges. The spring of

Barzun might perhaps be employed in some of the cases quoted as contra-indicated; but there are many other springs whose waters would be equally, if not more efficacious, and in situations more agreeable.

BONDONNEAU—in the department of *Drome*, at a distance of two and a half miles from *Montélimart*, possesses several cold sulphurous springs, near which a small bathing establishment has recently been erected.

BOULOU (LE)—a small town in the department of *Pyrénées-Orientales*, is situated at the distance of an hour's drive from *Amélie-les-Bains*, and two from Perpignan. It possesses three, somewhat weak, chalybeate springs, whose waters are limpid, inodorous, of a bitterish, ferruginous taste, and of a temperature about equal to that of the surrounding atmosphere. They are occasionally administered internally, either alone or in conjunction with the waters of *Amélie*. In addition to a small quantity of carbonate of iron, they contain, likewise, the carbonates of soda, magnesia, and lime, chloride of sodium, sulphate of soda, and silica, all in small quantities. They are slightly impregnated with carbonic acid gas.

BOURBON-LANCY—in the department of *Saone-et-Loire*, possesses hot saline springs, which arise in the suburb of *Saint-Leger*. Their temperature ranges between 82·40 and 132·80. The waters are not strongly charged with saline principles, the chief of which is chloride of sodium, of which they contain about seventeen grains to the pint. They are rarely frequented.

BOURBON-L'ARCHAMBAULT—in the department of *Allier*, thirteen miles west of *Moulins*, possesses a hot saline spring, which was much in vogue during the reign of Louis XIV., but has now fallen into neglect. Its temperature is about 125·00; and the waters contain, in addition to other saline

ingredients in smaller quantities, twenty grains of chloride of sodium to the pint.

BOURBONNE—a small town in the department of *Haute-Marne*, is situated upon a gentle acclivity and upland, at a distance of twenty miles east-north-east from Langres, near the confluence of the *Borne* and *Aspance*. It is the chief town of a canton and arrondissement, and may be reached from Paris by the Mulhouse Railway as far as *La Ferté*, and thence by an hour and a half's drive—about ten hours in all. It possesses three mineral springs, which give rise to waters of a limpid and inodorous quality, and of a temperature ranging from 122·00 to 136·40. In their chemical and physical properties, as well as in their therapeutic effects, these springs are nearly alike. A quart of the water, according to the analysis of MM. Mialhe and Figuier, contains of chloride of sodium, 39·277 grains; of chloride of magnesium, 5·881 grains; of sulphate of lime, 14·018 grains; and of bromide of sodium, 1·003 grains; giving a total, with other matters, of 128·039 grains of solid ingredients. Hence the waters are strongly saline. They are employed almost exclusively in the form of baths, and act upon the skin in the manner of astringent lotions, a property probably due to the absence of glairine or any other unctuous ingredient. The baths are administered with advantage in certain forms of paralysis without lesion of the cerebro-spinal system, but as the result of general atony and debility. In chronic wounds they are recommended where there is no trace of inflammatory symptoms in the region of the cicatrices; in sciatica, and in other complaints of the nervous and osseous system. They are likewise employed as deobstruents in conjestion of the abdominal viscera following intermittent fever.

BOURBOULE (*La*)—a hamlet in the department of *Puy-de-*

Dôme, is situated on the right bank of the Dordogne, at a distance of twenty-two miles south-west from Clermont. It is about four miles from Mont-Dore, and is reached by *voiture*, after leaving the railway at Clermont. The accommodation for visitors at La Bourboule is very meagre. The waters of the principal spring present considerable traces of arsenic, in addition to chloride of sodium, sulphate of soda, and bicarbonate of soda, in quantities varying from thirty to forty grains to the quart. They give off free carbonic acid gas, and have a temperature of 125·60. They are a good deal used by the neighbouring inhabitants, who find them useful in cutaneous affections, and in the scrofulous diathesis.

BRIDES—in Savoy, is situated at a distance of three miles from *Moutiers*, and rather less than that from *Salins*. It possesses a saline spring, whose waters have a temperature of 96·80. They contain, besides other mineralising principles, the sulphates of lime and soda, and the chloride of sodium; the two former in quantities of about 15 grains to the pint, the latter in about 10 grains in the same quantity of water. Their action is slightly purgative, and they are used chiefly as deobstruents.

BUSSANG—a village of the department of *Vosges*, lies near the source of the *Moselle*, at a distance of fourteen miles south-east from *Remiremont*. It possesses a cold acidulous chalybeate spring, which is used by those in the neighbourhood in cases requiring a ferruginous course of treatment. It is very weak.

CADÉAC—a small village of the *Hautes Pyrénées*—is situated in the *Val d'Aure*, near the town of Arreau, on the Neste. It possesses two springs of low temperature, but strongly impregnated with sulphur. Cadéac is but little frequented, owing to a want of accommodation, although its

waters are in good reputation for the alleviation of cutaneous affections, chronic disorders of the mucous membrane lining the air-passages, chronic rheumatisms, strumous enlargements, indolent ulcers, and in certain cases of uterine derangement. The spring on the right bank of the Neste contains 1·158 grains of sulphuret of sodium, that on the left bank, 1·034 grains in the quart.

CAILLE (*La*)—in Savoy, is about a three hours' drive from Geneva. It possesses cold sulphurous springs. They are recommended in chronic bronchial and laryngeal affections, and in many other disorders; but they have not hitherto been much frequented.

CAMBO—a village of the Basses Pyrénées, is situated in a fertile upland near the river Nive, at a distance of nine and a half miles south-south-east from Bayonne. It affords convenient accommodation for invalids at moderate charges, and is a good deal resorted to by those who have previously enjoyed sea-bathing at Biarritz. The scenery around Cambo is attractive, and presents many inducements to the invalid to lead him into a series of short excursions in the vicinity. The mineral springs are two in number, which make their appearance at about a hundred yards from each other on the banks of the Nive, and at scarcely a mile's distance from the village. One only of these, the sulphurous spring, is administered in the form of baths, the other—acidulated chalybeate—being employed internally. The former of these is but slightly, and accidentally, charged with sulphuretted hydrogen, and altogether is mild and non-stimulating in its medicinal action. It is recommended in cases where there is little tolerance of the more stimulating kinds. Its temperature ranges from 71·60 to 73·40. According to M. Salaignac, a quart of water contains the following ingredients:—*Solid*—Sulphate of magnesia, 7·658; carbonate

of magnesia, 1·933; chloride of magnesium, 1·933; sulphate of lime, 14·357; carbonate of lime, 4·863; alumina, 0·247; oxide of iron, 0·009; fatty matter soluble in ether, 0·402; insolubles, 0·009; silica, 0·185—Total in grains, 31·596. *Gaseous*—Nitrogen or azote, mixed with oxygen, 10·374; sulphuretted hydrogen, 0·244; carbonic acid, 0·122—Total in cubic inches, 10·740.

The ferruginous spring is administered as a useful tonic in chlorosis and menstrual derangement; and in cases of general debility marked by a loss of appetite and depression of spirits, whether proceeding from the enfeebling effects of a previous illness, or simply as the result of a deranged digestive system, the consequence of a too close application to business or study. M. Salaignac found the following ingredients in a quart of the water:—*Solid*—Carbonate of iron, 0·771; carbonate of lime, 0·200; sulphate of lime, 0·308; chloride of calcium, 0·402; vegetable matter, a trace; silica, a trace—Total in grains, 1·681. *Gaseous*—Nitrogen, or azote, with traces of oxygen, 1·281; carbonic acid, 0·061—Total in cubic inches, 1·342.

CAMPAGNE—a village in the maritime department of *Aude*, in the south of France, is situated in a pleasant valley upon the banks of the Aude. It possesses three springs yielding waters but slightly impregnated with mineralising principles, of which the chief are the sulphates and carbonates of lime, with a very small proportion of the proto-carbonate of iron. Their temperature varies between 78·000 and 80·60. Campagne is rarely resorted to by strangers; but its waters are employed by the neighbouring inhabitants in certain diseases, of which anœmia and chlorosis are the type.

CAPBERN (or *Capvern*)—a village in the department of the *Hautes-Pyrénées*, south of France, is agreeably situated in

a narrow valley about twelve miles from *Bagnères-de-Bigorre* on the road to Toulouse. The season extends from the middle of May to the end of September, during which period the little village of Capbern is maintained in constant animation by the unceasing traffic on the trunk-road from Toulouse to the baths generally. It contains two mineral springs, called respectively *Hount-Caoudo* and *Bouridé*. The *Hount-Caoudo* is situated at a little distance from the village, where about twenty houses, including a hotel, are fitted up for the reception of visitors. Its waters are transparent, limpid, and inoffensive to the taste and smell; they are supplied in large quantity at a temperature ranging between 72·50 and 73·00. Their action is stimulative to the organic functions generally, and should be administered with caution. They are recommended in cases requiring increased activity in the functions performed by the abdominal viscera, whether those of the liver, spleen, pancreas, mesentery, or the stomach itself. By increasing the flow of urine they are also found useful in facilitating the passage of urinary concretions, as well as in chronic affections of the bladder, and in derangement of the uterine functions. They have also been recommended as an efficient safeguard against many of the disorders attending the climacteric period in both sexes, especially to those of a rheumatic or gouty diathesis. They are contra-indicated in the low nervous type of constitution, and in hæmorrhages generally, especially that attending an advanced stage of phthisis. For bathing purposes these waters require the aid of artificial heat; but it is as a medicinal beverage that they are more usually employed. The spring of *Bouridé* is not much used. Its temperature is about 69·80, and, like that of Hount-Caoudo, is chiefly selenitic. It is rarely used alone, as it is found to act oppressively upon weakened digestive

powers: but it is sometimes administered in conjunction with the waters first mentioned. In general terms the waters of *La Source du Bouridé* are considered to be calmative and sedative in their therapeutic effects, and are recommended in cases of nervous excitation, of which hysteria is the type. According to the analysis of M. Latour, a quart of the water from the spring of Hount-Caoudo yields the following gaseous and solid constituents:—*Gaseous*—Carbonic acid, 29·903; oxygen, 10·985; nitrogen or azote, 17·087—Total in cubic inches, 57·975. *Solid*—Hydrochlorate of magnesia, 0·493; hydrochlorate of soda, 0·680; hydrochlorate of lime, 0·247; sulphate of magnesia, 7·101; sulphate of soda, 1·112; sub-carbonate of magnesia, 0·185; sub-carbonate of lime, 3·345; sulphate of lime, 16·922; carbonate of iron, 0·371; silica, 0·432; organic matter, 1·174—Total in grains, 32·062.

CASTELJALOUX—a small town in the *arrondissement* of *Nérac*, department of *Lot-et-Garonne*, south of France, is situated upon the *Avance*, on the trunk roads between Bordeaux and Auch, and between Paris and Spain. The town contains moderate accommodation for visitors. It has two mineral springs, which are a good deal frequented by the inhabitants of the neighbouring departments. The water is clear and limpid, inodorous and cold, and of a slightly ferruginous taste. It contains, besides a small quantity of carbonic acid gas, the carbonates of lime and magnesia; the sulphates of soda and lime; the chlorides of sodium, calcium, and magnesium; and the silicates of soda and lime, with a little free silica; and, in addition to these, a small quantity of the proto-carbonate of iron. The waters are administered as tonics and emmenagogues: and are contra-indicated in inflammatory affections as well as in plethoric constitutions. The mineral spring of Cours, at a

distance of six miles from Casteljaloux, in the direction of Bordeaux, has nearly the same chemical and physical constitution as that of the above spring, and is employed in a similar class of cases.

CASTERA-VERDUZAN—a village of the south of France, in the department of Gers, lies on the road about midway between Auch and Condom. It is pleasantly situated in the valley of the Gers, and being the nearest of the French mineral spas to the towns of Bordeaux, Toulouse and Agen, is frequented by the inhabitants of these places during the summer months, quite as much for the sake of relaxation from the arduous duties of business as for the medicinal reputation of the mineral waters. There are two springs at Verduzan, the one sulphurous, the other chalybeate, both of which supply a considerable number of baths. The *Grande-Fontaine*, or sulphurous spring, has an invariable temperature of 75·20; it yields a clear limpid water, having a strong sulphurous odour and taste, giving off at the time of its escape from the ground bubbles of sulphuretted hydrogen gas. When used in the form of baths this water requires additional heat by artificial means, which, to a certain degree, impairs its virtues. The *Petite Fontaine*, or chalybeate spring, is cold, and yields a colourless, inodorous, limpid fluid, with a strong ferruginous taste. It gives off a small amount of carbonic acid gas, but this does not appear to cause any decomposition, as the fluid still retains its transparent and colourless character. The waters of these two springs are frequently administered together, the former in baths, the latter internally. They are comparatively feeble in their medicinal effects, and are, on this account, recommended to invalids of delicate constitution, combined with nervous irritability, as in weakly children, and in many nervous disorders marked by derangement of

the uterine functions. The chalybeate spring is especially recommended in anæmia, chlorosis, &c. The climate of Verduzan is mild and equable, and gives rise to a luxuriant vegetation, particularly during the season of bathing, which extends from the middle of May to the end of October. From a residuum obtained by evaporating forty-four pounds *avoirdupois* of the water to dryness, M. Vauguelin obtained from each of the springs the following saline ingredients :—

		Sulphurous Residuum equal to 265·440 grains.	Chalybeate Residuum equal to 416·936 grains.
Soluble.	Chloride of calcium,	7·719	10·606
	Animal matter,	3·345	1·546
	Sulphate of lime,	3·045	1·794
	Sulphate of soda,	0·154	22·385
	Chloride of sodium,	0·200	1·546
Insoluble.	Sulphate of lime,	24·063	17·599
	Carbonate of lime,	12·504	12·613
	Animal matter,	0·123	1·545
	Oxide of iron,	...	3·045
	Total in grains,	51·173	73·060

CAUTERETS—a village of the Hautes-Pyrénées, is situated in a fertile basin at a distance of twenty-five miles south-south-west from Tarbes, and at an elevation of 3000 feet above the level of the sea. It is surrounded by steep and lofty mountains, which give an air of gloom to the locality, and procure for it a low summer temperature. Invalids should guard against exposure to the keen morning and evening air, and ought at all times to be warmly clad. The accommodation for invalids at Cauterets is very good, consisting of hotels and lodging-houses, which, however, during the height of the season, extending from the first of June to the fifteenth of September, are frequently so crowded as to require a previous application for apartments.

There is a decided deficiency of accommodation for out-door exercise, and consequently balls and assemblies are resorted to as an amusement for the many who visit Cauterets more for the pleasure of the society which it affords than on account of its waters. Invalids, however, are often greatly injured by an undue exposure at such places of amusement. Nevertheless, although an absence of a suitable promenade within the precincts of the village is to be regretted, there are many pleasant excursions to be made in the neighbourhood. The mineral springs of Cauterets are fourteen in number, divided into an eastern and a southern group. Belonging to the former are :—*Bruzaud*, 98·60 ; *Pauze-Vieux*, 111·20 ; *Espagnols*, 113·00 ; *Pauze-Neuf*, 114·80 ; *Rieumiset*, 114·80 ; *César-Vieux*, 118·40 ; and *César-Neuf*, 120·20. Belonging to the latter are :—*Le Petit Saint-Sauveur*, 86·00 ; *La Raillière*, 104·00 ; *Le Bois*, 111·20 ; *Le Pré*, 118·40 ; *Mahourat*, 120·20 ; *La Source des Œufs*, 131·00 ; and *La Source des Yeux*, 131·00. Of these the two latter are not made use of at all, and those of Mahourat and César-Vieux only as internal remedies. All the rest contribute to the supply of a large number of baths. In their physical and chemical properties these springs are nearly alike, although different in their therapeutic effects. In a quart of the water M. Longchamp found the following ingredients :—*Solid*—Chloride of sodium, 0·757 ; sulphuret of sodium, 0·293 ; sulphate of soda, 0·680 ; silica, 0·941 ; lime, 0·061 ; magnesia, a trace ; caustic soda, 0·046 ; barègine, caustic potash, ammonia, a trace—Total in grains, 2·778. *Gaseous*—Nitrogen or azote (cubic inches), 0·244.

The waters of Cauterets, having different temperatures and somewhat different ingredients, at least in quantity, have likewise different uses. Generally, however, they are employed medicinally in those cases which are amenable

to sulpho-thermal springs. In chronic rheumatism, and in certain cases of gout; in chronic affections of the larynx and bronchi, as well as in threatening phthisis; in nervous complaints, attended with depression of spirits; in uterine derangements; in congestion of the abdominal viscera, especially in chronic hepatic congestion; and in obstinate cutaneous eruptions, one or other of the springs of Cauterets will be found serviceable. Selection should be made with caution, and at all times under the direction of a resident physician.

CELLES—in the department of *Ardèche*, lies in a narrow valley near the Rhone, at a distance of three miles from the little towns of *Laroulte* and *Pouzin*. It is reached by rail as far as *Loriol*, and thence, for an hour and a half, by *voiture*. It possesses several cold saline, as well as chalybeate springs.

CHALLES—in Savoy, is situated at a distance of little more than three miles from Chambéry, to which point the railway conducts the traveller, leaving him to finish his journey by *voiture*, which occupies not more than half an hour. Challes possesses strong sulphur springs, whose waters contain about 7·80 grains of sulphuret of sodium in the quart. They are cold; and contain, in addition to the sulphuret of sodium, appreciable quantities of bromide of sodium and of ioduret of potassium, besides alkaline carbonates and silicates. They are recommended in various cutaneous affections; in diseases of a scrofulous tendency, and in chronic syphilis.

CHARBONNIÈRE—in the department of the *Rhone*, five miles from Lyons, possesses two cold ferruginous springs, which are employed in dyspepsia, strumous affections, chlorosis, &c.

CHÂTEAUNEUF—a hamlet in the department of *Puy-de-Dôme*, rests upon the banks of the *Sioule*, a tributary of

the *Allier*, in the midst of the mountain chain of lower *Auvergne*. It possesses several alkaline mineral springs, impregnated with carbonic acid gas, and of a temperature ranging between 59·00 and 100·40. The waters contain the bicarbonate of soda and salts of lime and magnesia. They are employed by those in the vicinity as tonics and deobstruents.

CHÂTEAU-GONTHIER—in the department of *Mayenne*, possesses cold ferruginous springs, which are employed in cases of general debility.

CHATELDON—a town in the department of *Puy-de-Dôme*, is situated at a distance of eight miles from *Vichy*. It possesses two cold alkaline springs, charged with carbonic acid gas, which are chiefly employed in atonic dyspepsia.

CHAUDES-AIGUES—a small town in the department of *Cantal*, is ensconced in a wild pass amongst the mountains which separate *Gévaudan* from *Auvergne*. Its springs are but slightly impregnated with mineralising principles; but they have a temperature of 177·80.

CONTREXÉVILLE—a village in the department of Vosges, possesses cold alkaline springs, slightly imbued with ferruginous principles. They contain, in addition to traces of iron, the sulphates of lime, soda, and magnesia, and likewise the bicarbonates of the same bases. The waters are employed as deobstruents, and in disorders of the genito-urinary system, especially in several kinds of calculous affections.

SAINT-CHRISTAU.—The ferruginous springs of St Christau occur in the department of the *Basses-Pyrénées*, at a distance of five miles from *Oloron*, in the valley of the *Aspe*. The bathing establishment consists of three houses fitted up for the reception of invalids, and others who resort to them for the use of the waters. Besides the chalybeate, there is

likewise a cold sulphurous spring, employed in affections of the skin, the former being used as a slight tonic in nervous disorders with relaxed fibre—in chlorosis, anæmia, and functional disorders of the uterus.

CRANSAC—a village in the department of *Aveyron*, is situated in a valley at the distance of twenty-one miles from *Villefranche*. It possesses several mineral springs, which issue at the foot of a mountain of volcanic formation. The water is limpid, inodorous, of a slightly astringent taste, and of a temperature the same as that of the surrounding air. It contains the sulphates of lime, magnesia, alumina, iron, and manganese. It is employed as a deobstruent.

DAX—a small town in the department of *Landes*, south of France, rests upon the left bank of the *Adour*, at a distance of thirty-two miles from Mont-de-Marsan, twenty-nine from Bayonne, and about eighty from Bordeaux. The climate of Dax is mild and equable; the mean annual temperature is 56·53, and that for the seasons—Winter, 44·08; spring, 56·45; summer, 68·60; and autumn, 56·98. The town contains six thousand inhabitants, and affords good accommodation for visitors. The mineral springs of Dax are very numerous, varying in temperature between 86·00 and 156·00. They are employed only in the form of baths, and are in high esteem for the cure of chronic rheumatism, sciatica, certain forms of paralysis, and other maladies requiring saline baths at a high temperature. The chlorides of sodium and magnesium, the carbonates of magnesia, and the sulphates of lime and soda, in small quantities, constitute the mineralising principles.

DENIS (*Saint*)—in the department of Loir-et-Cher, possesses three cold chalybeate springs, which are used in cases of general debility.

DIGNE (*Dinia*)—the capital of the department of the

Basses Alpes, is situated near the left bank of the *Bleone*, at a distance of fifty-five miles north-east from Aix. The mineral springs of Digne rise in a narrow pass about a mile from the town. The waters are of the sulpho-thermal order, and vary in temperature from 93·20 to 113·00. They are a good deal frequented by the inhabitants of the neighbouring country, who find them useful in chronic rheumatism and obstinate cutaneous affections.

EAUX-BONNES—the village so called, on account of the mineral springs which it possesses, is situated in the south of France, in the department of the *Basses Pyrénées*, at a distance of twenty-two miles in a southerly direction from Pau. It is ensconced in the valley of Ossau, at a short distance from Laruns and from Eaux-Chaudes, at an elevation of 2590 feet above the level of the sea. By reason of its position, the valley is exposed to floods after heavy falls of rain, as well as during the melting of the mountain snow. The village itself is agreeably situated, and consists of a single row of houses, made up entirely of hotels or lodging-houses for the accommodation of invalids resorting to the baths. With the exception of several well-constructed promenades, the place is destitute of entertainment, and presents none of the evening réunions which in many summer watering-places are so hurtful to the invalid. But, to make up for this, the neighbourhood of Eaux-Bonnes abounds with places of interest, to which excursions may easily be made either on foot by the strong and active, or on horses, which are well accustomed to the work of ascending the lofty summits of the Pyrenees. The springs of Eaux-Bonnes are three in number, and make their appearance at the foot of Mount *Trésor* under the following names in the progressive order of their temperature:—*La Nouvelle*, 87·80; the spring of *En bas*, 89·60; and *La Buvette* (or *La Vieille*),

91·40. Beyond these, at a little distance from the village, are two other springs of a lower temperature; namely, the spring of *Ortech*, 73·40, and that termed *La Froide*, 55·40. The latter are employed only internally, whilst the others, although not very profuse in their supplies, are used likewise in the form of baths. According to a recent analysis by M. O. Henry, a quart of the water contains the following solid and gaseous ingredients:—

SOLID.	
Hydrochlorate of soda,	0·517
„ magnesia,	0·108
„ potash,	a trace.
Sulphate of lime,	2·841
„ magnesia,	0·301
Carbonate of lime,	0·115
Oxide of iron,	0·154
Silica,	0·231
Organic matter, impregnated with sulphur,	2·564
Free sulphur,	a trace.
Total in grains,	6·831
GASEOUS.	
Nitrogen or azote,	1·525
Carbonic acid,	0·488
Sulphuretted hydrogen,	0·671
Total in cubic inches,	2·684

The waters of Eaux-Bonnes are employed chiefly as internal remedies. They are not, as the above analysis suggests, possessed of very exciting properties, nevertheless they are strongly recommended in certain chronic maladies, in which they are supposed to be more effective than many other waters more largely impregnated with mineral ingredients. In the scrofulous diathesis, with a general laxity of the tissues; in nervous inflammatory affections of the

larynx and bronchi; in some cases of humoral asthma, as well as in chronic rheumatism, the springs of Eaux-Bonnes are available. The cold springs, moreover, are employed in cases showing a want of blood corpuscles; in chlorosis; in anœmia; and in some cases of dysmenorrhœa, or where the period at which the catamenial function commences is unusually protracted. In acute inflammatory attacks, as well as in advanced stages of phthisis, their employment is contra-indicated.

EAUX-CHAUDES—the village bearing this name is reached from Pau by the road leading to Eaux-Bonnes as far as *Laruns*, where the common route bifurcates, sending its branch towards Eaux-Chaudes by the marble bridge across the *Gave de Gabas*. This village is twenty-two miles distant from Pau in a southerly direction, and a little more than seventy miles from Bayonne, at an elevation of 2208 feet above the level of the sea. It is situated in a deep cleft between lofty mountains whose contrast of vegetation and barrenness invests the scenery with peculiar attractions; and so overshadowed is the village by the neighbouring summits, that the solar beams can rest upon it but for a few hours each day. In this secluded spot summer accommodation is afforded in from twenty to thirty houses erected for the purpose either in the form of hotels or lodging-houses. A constant intercourse with Eaux-Bonnes is maintained by the passage of an omnibus several times a-day; and, besides this, there are several other excursions which may be made to neighbouring places, although not without considerable energy and a certain amount of physical activity and strength. Invalids visiting this valley, and the same remark applies equally to Eaux-Bonnes, should be careful to keep themselves constantly warmly clad, as the vicissitudes of temperature are very marked. These springs

were much resorted to in former times, especially during the regime of Navarre; but they subsequently fell into neglect, from which they are now gradually emanating. The springs of Eaux-Chaudes make their appearance at the foot of the mountain which separates the valley in which they are found from that containing the mineral waters of Bonnes; they are six in number, and bear the following names, taken in the progressive order of their temperature:—*Mainvielle*, 51·80; *Larressecq*, 77·00; *Baudot*, 80·60; *L'Esquirette*, 89·60; *Le Rey*, 93·20; *Le Clôt*, 96·80. These waters are very abundant, and are used both internally as well as in the form of baths. According to the analysis of M. Filhol, Professor of Chemistry at Toulouse, a quart of the water yields the following ingredients:—

Chloride of sodium,	1·778
Sulphuret of sodium,	0·128
Carbonate of soda,	0·540
Sulphate of soda,	0·649
Sulphate of lime,	1·592
Silicate of lime,	0·077
Silicate of magnesia, Silicate of alumina,	a trace
Iodine,	a trace
Total in grains,	4·764

These waters are much employed in chronic rheumatisms, in neuralgia, and in certain obstinate cutaneous affections; as well as in scrofulous enlargements, in chlorosis, and in functional disorders of the uterine system with absence of the catamenia. They appear to be especially applicable to persons of sluggish, lymphatic temperament to whose vital energies they speedily impart a beneficial impulse. In cases requiring a diminution rather than an augmenta-

tion of the circulatory force they are contra-indicated. As in all other classes of mineral waters, those of Eaux-Chaudes, although alike in their leading therapeutic effects, have individual peculiarities which the invalid ought to be aware of before making use of them. To afford this necessary information belongs to resident physicians, who, having had much experience of their administration, are familiar with their distinguishing characteristics.

ENCAUSSE—a village of the department of *Haute-Garonne*, in the south of France, is situated in a valley through which runs the rivulet called *Jops*. The village lies about a mile off the road connecting *Saint Gaudens* and Aspet, and is about six miles distant from the former place. The accommodation for visitors is not very extensive, but sufficient for the reception of between five and six hundred during the season which extends from the middle of May to the end of September. The waters proceeding from two springs at a temperature of 73·40 are colourless, transparent, inodorous, and of a slightly styptic taste. They are purgative and diuretic in their effects, and are employed in certain forms of dyspepsia; as deobstruents; in cases of obstinate intermittent fevers; and in chronic affections of the genito-urinary system in both sexes. A quart of the water yields, on analysis:—6·591 cubic inches of carbonic acid gas; 24·546 grains of sulphate of lime; 8·655 grains of the sulphates of soda and magnesia; 5·407 grains of the chloride of magnesium; 3·231 grains of the carbonate of lime; and 0·649 of a grain of the carbonate of magnesia.

ENGHIEN—in the department of *Seine-et-Oise*, possesses several cold sulphurous springs. The waters are impregnated with salts of lime, and contain a little sulphuretted-hydrogen gas. They are recommended in chronic affections of the respiratory organs; in cutaneous affections; muscular

and articular rheumatism; leucorrhœa; certain kinds of paralysis; and in constitutional syphilis.

ESCALDAS (*Aguas Caldas*)—a village of the canton of Sallagosa, is situated at a considerable elevation on the southern aspect of the *Pyrénées Orientales*, overlooking Cerdagne, at a distance of forty miles from Perpignan, and three from *Puycerda*, in Spain. There are two bathing establishments in Escaldas, both of which are much frequented by Spaniards and the inhabitants of the surrounding country generally. The temperature of the mineral springs varies from 92·80 to 108·50. They are employed in obstinate skin diseases; in syphilitic eruptions; and also in chronic rheumatism and affections of the genito-urinary system in both sexes. Their chemical and physical constitution is very nearly the same as that of the waters of *La Preste*.

EVIAN—in the department of *Haute Savoie*, is built upon the borders of the Lake of Geneva, opposite Lausanne. It possesses cold springs impregnated with the bicarbonates of soda, lime, and magnesia in small quantities. The waters exercise a slightly diuretic effect, and are recommended in disorders of the genito-urinary system. They amount to little more than ordinary spring water.

FONCIRGUE.—The thermal establishment of Foncirgue is situated at the foot of a mountain in the canton of *Mirepoix*, in the department of Ariège, south of France. The small establishment, erected for the medicinal employment of the mineral spring, is frequented chiefly by invalids from the neighbouring country. It is placed near the road which connects Limoux and Foix, and offers to the use of invalids a colourless, inodorous, limpid water, whose taste is somewhat styptic, and whose temperature never varies from that of 68·00. Its use is recommended in congestions of the

abdominal viscera; in chronic rheumatisms and cutaneous affections; and in disorders of the genito-urinary system, especially those accompanied with a mal-performance of the uterine functions. When used in the form of baths the water requires the aid of artificial heat. Besides small quantities of carbonic acid, oxygen, and nitrogen or azotic gases, the water contains the sulphates of lime, soda, and magnesia; the chlorides of magnesium and calcium; the carbonates of lime and magnesia; oxide of iron; silica and organic matter, but none of them in large amount.

GAMARDE—a little town in the department *Landes*, south of France, is eight miles distant from *Dax*, and thirty-six from Bayonne. It occupies a pleasant position in a mild and healthy climate. On the left bank of the *Louts*, a small stream running near the town, are several sulphurous springs collected into a bathing establishment. The water issuing from these springs is cold, and charged with a moderate volume of sulphuretted hydrogen and carbonic acid gases. The waters are employed in those complaints in which sulphur springs at low temperature are considered beneficial. According to M. Salaignac's analysis, a quart of the water contains the following ingredients:—*Solid*—Chloride of magnesium, 1·360; chloride of sodium, 10·800; sulphate of lime, 1·871; carbonate of lime, 3·520; carbonate of magnesia, 0·387; fatty matter, 0·154; extractive, 0·170; silica, 0·185—Total in grains, 18·147. *Gaseous*—Sulphuretted hydrogen, 10·252; carbonic acid, 6·102—Total in cubic inches, 16·354.

GAZOST.—The springs of Gazost, situated upon an upland of the valley of Castelloubon, in the department of the *Hautes Pyrénés*, are accessible only to pedestrians, or, at most, to sure-footed horses. They are two in number, and enjoy a local reputation for the cure of many com-

plaints whose inveteracy has previously defied the application of many others of the Pyrenean springs. M. Filhol believes they contain considerable traces of iodine, and that to its influence chiefly they owe their therapeutic influence. M. O. Henry, who examined a quantity of the water sent to him at Paris, gives the following as the result of his analysis. In a quart he found:—Sulphuret of sodium, 0·493; sulphuret of calcium, a trace; chloride of sodium, 4·941; chloride of potassium, 0·308; carbonate of soda, a trace; silicate of soda, 0·247; sulphate of soda, indications of; bicarbonate of lime and bicarbonate of magnesia, 0·757; silica and silicate of alumina, 0·802; oxide of iron, traces; organic matter, 0·308; mineralising principles, 7·857—Total in grains, 15·713.

GERVAIS (*Saint*)—in the department of *Haute Savoie*, is situated in a valley which opens near *Sallenches*, on the route from Geneva to Chamounix. It possesses several thermo-sulphur springs, which contain, amongst other ingredients, sulphuret of calcium, sulphate of soda, and chloride of sodium. They have an average temperature of 104·00, and are recommended in cases for which slightly purgative sulpho-thermal baths are suitable.

GREOULX—a village of the department *Basses Alpes*, in the South of France, is situated on the southern declivity of the Alps, at a distance of thirty miles to the south-west of Digne. The village is approached by a drive of four hours and a half from Aix, the former capital of Provence, near the centre of which Greoulx lies. The waters, which have their source about a mile from the village, pertain to the class of *sulpho-thermals*. Their temperature departs but very triflingly from that of 97·70; they are abundant in quantity, and contain, besides an impregnation with sulphuretted hydrogen gas, salts of lime, soda, and magnesia,

with traces of iodine. They are recommended in such cases as usually resort to spas of this kind, of which may be mentioned chronic rheumatism; obstinate cutaneous affections; certain kinds of paralysis; chronic wounds; chronic diseases of the osseous system, as caries and necrosis; some cases of incipient phthisis, and certain forms of uterine derangement.

HONORÉ (*Saint*)—in the department of *Nièvre*, is situated at a distance of eleven miles south-south-west from Château-Chinon. The railway from Paris conducts as far as Nevers, leaving a journey of six hours by *voiture* from that point to Saint Honoré. The springs belong to the class of tepid sulphurous, having a temperature of 89·60. The waters contain alkaline sulphurets, and a little free sulphuretted hydrogen gas, and are recommended in cases to which baths of such a character are suitable.

LABASSÈRE—a mineral spring of the *Hautes Pyrénées*, in *Val d'Oussouet*, about four miles distant from *Bagnères-de-Bigorre*. The water issues at a low temperature, is strongly impregnated with the sulphuret and chloride of sodium, and contains evident traces of iodine. The inhospitable nature of the region in which this spring issues from the rocks prevents its employment on the spot, and it would probably have passed unnoticed altogether, but for the fact of its waters being transportable without decomposition to other countries. For this purpose it is the best of the Pyrenean springs, and has acquired a high reputation as a medicinal beverage in many parts of France. It is given internally in those cases in which the sulphurous waters of the Pyrenees are used generally, and moreover, it is said, with special advantage, in phthisis, and all chronic affections of the mucous membrane lining the air-passages, and in pellagra. In a quart of the water, M. Filhol found the

following ingredients —sulphate of soda, [illegible] sulphate of lime, carbonate of lime, chloride of sodium, chloride of potassium, [illegible] carbonate of soda, [illegible] carbonate of soda, potash, and lime, traces of silica, [illegible] chloride of ammonia, [illegible] chloride of magnesium, [illegible] iodine in traces, [illegible] some trace [illegible] lime—all in grains. [illegible]

Luchon.—The mineral springs of Luchon abound nearly a mile to the south and the south-east of the town of Luchon, which is situated in the department of *Haute-Garonne*, France. The waters supplied by the springs are [illegible] and their bathing establishments are clean and [illegible] and the [illegible] place in these and of a temperature [illegible] to that of the air. They are employed in [illegible] and related maladies, and are also recommended in [illegible] of the abdominal viscera, in [illegible] engorgements of the chronic affections of the genito-urinary system. Besides carbonic acid gas, the waters contain the carbonates of lime, magnesia, and soda, the sulphates of lime, magnesia, and soda, the chlorides of magnesium and sodium, with traces of ammonia: most of the above being in small quantities.

Luxeuil.—Luxeuil, in the department of *Haute-Saone*, is situated at the base of the Vosges Mountains, and may be reached from Paris in ten hours by rail as far as Saint-Loup, and thence by an hour's drive. The town consists of but one street, and is somewhat dull, at least when compared with the much-frequented baths of Plombières, which are but a short distance from it. The mineral springs, which were known to the Romans, are very numerous. They are chiefly thermo-salines, but one or two are impregnated with ferruginous principles, and are of lower temperature. The saline springs contain chloride of sodium,

about twelve grains to the quart, sulphate of soda, and alkaline carbonates. The water is limpid and inodorous. Although Plombières swallows up the greater portion of the summer visitors to this district, still a good many find their way to Luxeuil, where there is a tolerably comfortable thermal establishment. The temperature of the water varies from 86·00 to 132·80. The ferruginous springs yield traces of the oxide, phosphate, and arseniate of iron. The former waters are employed in chronic rheumatism, sciatica, in certain forms of dyspepsia, and in uterine derangement. The latter are used as tonics and alteratives.

La Malou—a bathing establishment in the department of *Herault*, South of France, is situated in an agreeable valley about an hour's ride from *Bédarieux*, and not far from Cette and Montpelier. The springs of Malou belong to the class saline-chalybeates, with the peculiarity of an elevated temperature. They are divided into three establishments, *La Malou-le-Bas; La-Malou-du-centre;* and *La-Malou-le-Haut.* They have an average temperature of 91·40; the highest being 95·00. Besides a moderate ferruginous impregnation, the waters also contain the carbonates of lime, soda, magnesia, &c., and are recommended in cases of general debility, attended with a diminution of blood corpuscles, as well as in many nervous disorders, of which hysteria is the type.

Sainte-Marie—a village of the department of the *Hautes-Pyrénées*, south of France, is situated in a fertile valley near the banks of the Garonne, twelve miles distant from *Bagnères-de-Luchon*, on the road towards Toulouse. There are four mineral springs at Sainte-Marie, two only of which are employed medicinally. The waters, which they yield at a temperature of 62·60, are recommended as deobstruents, and in chronic affections of the genito-urinary system. A

quart of the water, according to M. Sane, yields 9·764 cubic inches of carbonic acid gas; sulphate of lime, 6·638; sulphate of magnesia, 8·95: carbonate of magnesia, 0·308; and of carbonate of lime, 5·713 grains.

MARLIOZ—in Savoy, is not more than a quarter of an hour's drive from Aix. It possesses cold sulphurous springs, whose waters are employed internally, whilst those of Aix are used chiefly in the form of baths. They are recommended in chronic affections of the respiratory organs.

MOLTIG—a village of the department of the *Pyrénées Orientales*, is situated upon an upland and surrounded by mountains in the midst of attractive scenery. It is reached from Perpignan by the road leading to Mont-Louis, which is left at Prades for a branch striking directly north. Moltig is about four and a half miles from Prades. The mineral waters have nearly the same chemical and physical constitution as those of *La Preste*, and are recommended in the same class of cases. Their temperature ranges from 95·00 to 100·40; and the season for their employment extends from the middle of May to the end of September.

MONT-DORE—a village of the department *Puy-de-Dôme*, is situated in the valley of the Dordogne, a small stream a little to the south of Clermont. The traveller for Mont-Dore leaves the railway at the latter place, and accomplishes the rest of his journey in a *voiture*, which traverses the distance in about six hours. The country around is remarkable for its volcanic remains, and the mineral springs make their escape at the base of a mountain on the north side of the volcanic range. There is one cold spring which contains free carbonic acid gas, besides a small amount of mineralising principles; the rest, six in number, are thermal, and are collected into a somewhat rude establishment for

medicinal application. The waters are limpid and inodorous, charged with carbonic acid gas, and of a temperature ranging from 107·60 to 114·80. They contain the bicarbonates of soda, lime, and iron, as well as the chloride of sodium in small quantities. In addition to these, according to some authorities, they are impregnated with traces of arsenic. But it is probably to their high temperature chiefly that the waters owe their therapeutic properties. They are used as baths, and also by internal administration at a tolerably high temperature. The springs of Mont-Dore had formerly a high reputation for the cure of phthisis, but such a qualification is rarely appended to them in the present day. They should be taken with caution, and their use should not be prolonged.

MONETIER (*Le*)—in the department of *Hautes-Alpes*, at a distance of six miles from Briançon, possesses sulphosaline springs, at a temperature ranging between 86·00 and 113·00. They are employed by those in the vicinity for the cure of chronic rheumatism, and in cutaneous and scrofulous affections.

MONTMIRAIL—in the department of *Vaucluse*, possesses two cold mineral springs, the one sulphurous and of little importance, the other, strongly impregnated with sulphate of magnesia, being not unlike those of Epsom and Sedlitz. It is employed in obstinate constipation and in visceral congestion. A quart of the water contains 143 grains of sulphate of magnesia, 78 grains of sulphate of soda, and 15 grains of sulphate of lime. There is a small thermal establishment at Montmirail.

MOTTE (*La*)—in the department of *Isère*, is situated at a distance of twenty miles from Grenoble, whence it is reached by *voiture* in three hours. It possesses thermo-saline springs; but the temperature is greatly reduced in con-

ducting their waters to the thermal establishment, the old chateau of *La Motte*. The temperature at the spring itself is 143·60. The waters contain chloride of sodium (30 grains to the pint), sulphate of lime, and the carbonates of lime and magnesia. They are recommended in visceral congestion, and in injuries of the articulations, as well as in scrofulous diatheses. They are but little frequented.

NECTAIRE (*St*—in the department of *Puy-de-Dôme*, is situated at a distance of eighteen miles west from *Issoire*, and eight from Mont-Dore. It possesses hot saline springs, whose temperature ranges between 64·40 and 104·00, and whose waters contain chloride of sodium, bicarbonates of soda, lime, and magnesia, besides alumina and the oxide of iron. They are given in certain forms of dyspepsia, in leucorrhœa, and affections of the genito-urinary system generally, and as deobstruents in congestion of the abdominal viscera.

NERIS—a town of the department of *Allier*, nine miles south-east of Montluçon, possesses several hot saline springs, the *Aquæ Neræ* of other days. The waters are limpid and inodorous, having a temperature ranging between 125·60 and 127·40. They contain the bicarbonates of soda and lime, with sulphate of soda and chloride of sodium, all in small quantities. They are employed in neuralgia of various kinds, and in many nervous disorders, of which hysteria is the type. They are also administered in chronic rheumatism, and in cutaneous affections. The season extends from May to October.

NEYRAC—in the department of *Ardèche*, and situated on the left bank of the river of that name, nine miles from *Aubenas*, possesses tepid saline springs, which are used in certain cutaneous affections.

NIEDERBRONN—a town of the department of *Bas-Rhin*,

lies in the midst of an agreeable and fertile valley, on the eastern side of the Vosges Mountains. From Paris the route is towards Strasbourg as far as Hochfelden Station, and thence by a two hours' drive. The mineral springs of Niederbronn are two in number, whose waters are limpid, inodorous, and of a temperature of 64·40. They contain the chlorides of sodium, calcium, and magnesium in considerable quantities, besides a trace of the bromide of sodium. They are used as gentle laxatives and alteratives, and are recommended in cases of feeble digestive powers, with a sense of distension at the præcordium, accompanied by a sluggish action of the bowels; in congestion of the abdominal viscera, especially of the liver, and in the scrofulous diathesis.

OLETTE—a village and capital of a canton in the department of the *Pyrénées Orientales*, is situated on the right bank of the river *Tet*, at a distance of nine miles west-south-west from Prades. The mineral waters in the neighbourhood of Olette are numerous, and of a temperature ranging between 82·40 and 172·40. According to M. Bouis, a quart of the water contains the following mineral ingredients, besides an unascertained quantity of oxygen and azotic gases :—Sulphuret of sodium, 0·463; silica, 2·528; carbonate of soda, 0·587; potash, 0·139; soda, 0·587; sulphate of soda, 0·493; chloride of sodium, 0·493; lime, 0·108; alumina, magnesia, iron, iodine, 0·649; azotised matter, 0·555.—Total in grains, 6·602. The baths are used in chronic rheumatism, in certain obstinate skin diseases, in affections of the genito-urinary system in both sexes, in some forms of dyspepsia, and in many disorders of a low nervous type.

PASSY—a suburb of Paris, has several cold ferruginous springs, containing about seven grains of the sulphate of iron in a quart of the water. This water is employed as a

tonic, but not until it has stood for about a fortnight in a reservoir, when, having by decomposition lost a large portion of its iron in the form of deposit, it is comparatively mild in its effects.

PENTICOSA—a village in the province of Aragon, north of Spain, is situated in the valley of *Tena*, at about half a day's journey from the frontier. The mineral springs of Penticosa are placed at a considerable elevation above the town, and are reached by what is termed *El Escalar*, a rugged ascent requiring nearly two hours for the journey. In this lofty situation there is an hotel for the accommodation of bathers, as well as an establishment for taking a course of the water. The scenery around is wild and attractive; but altogether the place is scarcely adapted for delicate invalids. The waters supplied by these springs belong to the class termed sulphurous, and are recommended in chronic rheumatism, obstinate cutaneous affections, derangement of the uterine functions, &c.

PIERREFONDS—a village in the department of *Oise*, to the south of the forest of Compiègne, possesses cold sulphurous springs, whose waters are slightly charged with free sulphuretted hydrogen gas, and are employed in chronic rheumatism, cutaneous affections, &c.

PLOMBIÈRES—a small town of the department of *Vosges*, is one of the most fashionable of French watering-places. It is situated in a deep valley near the southern confines of the department, and at an elevation of 1382 feet above the level of the sea. The river Eau-Gronne passes through it. From Paris the journey to Plombières is made by rail as far as Epinal, and thence by *voiture*, the latter part occupying about three hours. The fullest accommodation is afforded to visitors during the season, which extends from May till October. There are six distinct bathing establish-

ments, all fitted in superior style, and with a view to the comfort of invalids. The waters of Plombières are limpid and inodorous, and of a somewhat soft and unctuous touch. Their temperature ranges between 80·60 and 159·80, besides the Savonneuses, which are almost cold. They contain a very small amount of mineralising principles, and that chiefly consisting of the silicates of soda, lime, and magnesia, the sulphate of soda and silicic acid, together with minute traces of alumina, iron, and arsenic; nevertheless, they enjoy a therapeutic celebrity of no mean order. The waters are usually employed in the form of baths; but occasionally those of the *Crucifix*, of the *Bains des Dames*, one of the *Sources Savonneuses*, and the cold chalybeate spring called *Bourdeille*, are administered internally, when they have usually a stimulating, tonic, and diuretic effect. The list of maladies which these waters are reported as curative of, comprises, amongst others, the following:—Chronic rheumatism, and certain forms of gout; obstinate cutaneous affections; neuralgia of various kinds, especially tic and sciatica; some nervous disorders, as chorea; certain affections of the uterus, attended by congestion of the cervix, besides functional derangements of that organ, including *sterility*; and they are said likewise to be particularly efficacious in the cure of chronic diarrhœa and dysentery.

POUGUES—in the department of *Nievre*, at an hour's distance by *voiture* from the railway at *Nevers*, possesses a single cold saline spring, whose waters contain the bicarbonates of soda, lime, magnesia, and iron in moderate quantities. They are chiefly administered internally in cases of dyspepsia with anœmia; in a variety of calculous affections; and in disorders of the genito-urinary system generally.

POUILLON—a small town of three thousand inhabitants, in the department of *Landes*, south of France, is situated be-

tween the small river *Luy* and the *Gave de Pau*, at a distance of six miles south-south-east from Dax, and twenty-eight north-north-east from Bayonne. In the vicinity of the town is a mineral spring, yielding a colourless, inodorous water, bitter to the taste, and of the temperature of 68·00. The chlorides of sodium (about twelve grains to the pint) and magnesium, and the carbonate and sulphate of lime, constitute its mineralising principles. The waters of Pouillon are used in chronic rheumatism, scrofulous enlargements, indolent ulcers, and in obstinate intermittent fevers. They are contra-indicated in plethoric constitutions.

PRECHAC—a village of the department of *Landes*, in the south of France, contains a saline mineral spring; but, by reason of the unhealthy position of the village, situated as it is on marshy ground, as well as from the indifferent accommodation, it is rarely frequented.

LA PRESTE—a hamlet in the department of the *Pyrénées Orientales*, is situated upon an upland on the route from Perpignan to Arles, Prats-de-Mollo, and La Preste. It is about thirty miles from Perpignan, ten from Arles, and four from Prats. The springs are much frequented by the inhabitants of the surrounding districts during the season, which extends from May to September. The waters are clear and limpid, having the usual sulphurous odour and taste. They are prescribed chiefly as diuretics in affections of the genito-urinary system, as also in other cases in which the sulphurous waters of the Pyrenean spas are usually recommended. A quart of the water, according to M. Anglada, contains the following mineral ingredients :—Glairine, 0·154; hydrosulphate of soda, 0·185; carbonate of soda, 0·602; carbonate of potash, traces; sulphate of soda, 0·308; chloride of sodium, 0·015; silica, 0·649; carbonate of lime,

0·005; sulphate of lime, 0·003; carbonate of magnesia, a trace.—Total in grains, 1·921. Its temperature is about 111·20.

RENNES—a village of the maritime department of *Aude*, in the south of France, is situated in a mountain pass at a slight elevation, and about thirty miles distant from Perpignan. It possesses not less than five chalybeate springs, three of which belong to the order of thermal springs, whilst the remaining two are cold. The waters are employed by the neighbouring inhabitants in cases indicating a want of general tonicity, and are reputed efficacious in anœmia and chlorosis.

ROYAT—a village of the department of *Puy-de-Dôme*, half a mile from Clermont-Ferrand, contains hot saline mineral springs, whose waters are limpid and inodorous, having a somewhat bitterish taste. They contain the bicarbonates of lime, soda, magnesia, potash, and iron, with the chloride of sodium, of which the bicarbonate of soda and the chloride of sodium are in quantities of about twenty grains to the quart, and the double bicarbonate of lime and magnesia about twenty-four grains to the quart. They contain also a little free carbonic acid gas, and a trace of arsenic. Their temperature is invariably that of 95·00. The affections in which these waters are said to be efficacious are numerous. Amongst others may be mentioned—chronic affections of the larynx and bronchi, incipient phthisis, humoral asthma, gout, rheumatism, uterine affections, nervous diseases, cutaneous affections, &c.

SALINS—a town of the department of the *Jura*, is situated on the *Furieuse*, at a distance of twenty-one miles south-south-west from Besançon. It possesses cold saline springs, strongly impregnated with chloride of sodium.

SALINS—in Savoy, possesses saline springs at a tempera-

[illegible] These are like those of Salins in the Jura, strongly impregnated with muriate of soda. [illegible] to the pint of water. They are employed in scrofulous [illegible]

[illegible]—a village of the Hautes-Pyrenees, occupies a pleasant position in the valley of *Luz*, at a distance of a mile and a half south-west from the town of that name, and at an elevation of 1,000 feet above the level of the sea. It is about twenty-six miles from Tarbes, and upwards of four hundred from Paris. The village consists of a single street containing about thirty houses, erected for the accommodation of visitors during the bathing season. The houses on one side of the road recline against the base of the mountain from which the mineral waters take their origin, whilst those on the opposite side overlook a precipice of 300 feet, in the depths of which flows the *Gave de Gavarnie*. The road from Tarbes to Saint-Sauveur is the same which conducts to Cauterets as far as *Pierrefitte*, and subsequently, at least as far as *Luz*, the road is common to the baths of Saint-Sauveur, and those of Bareges. It traverses the banks of the Gave by means of a bold *corniche* road cut in the mountain sides, crossing it at frequent intervals by means of seven bridges. The accommodation for invalids at Saint-Sauveur is equal to that at other of the Pyrenean spas, and is less expensive. The village itself has well-constructed promenades, and the neighbourhood affords ample scope for excursions, in which the students of natural history will find much to engage their attention. There is but one mineral spring at Saint-Sauveur, although each of its several outlets receives a different name. The water, which it yields in abundance, is limpid and transparent, unctuous to the touch, and possesses the disagreeable odour and taste of water impregnated with sulphuretted hydrogen.

M. Longchamp's analysis gives the following as the amount of solid and gaseous ingredients in a quart of the water :—

SOLID.	
Sulphuret of sodium,	0·387
Chloride of sodium,	1·127
Sulphate of soda,	0·587
Silica,	0·771
Lime,	0·015
Magnesia,	a trace
Caustic soda,	0·077
Caustic potash, Ammonia, Barègine,	a trace
Total in grains,	2·964
Nitrogen, or azote (cubic inches),	0·244

The temperature of this water does not exceed 95°, and the amount of sulphurous impregnation, as noticed in the above analysis, is very slight. Hence, the spring of Saint-Sauveur is mild in its medicinal effects, and is well adapted to persons unable to bear the action of the stronger waters of the Pyrenees. It is recommended in cases of nervous excitement, accompanied by an alternating flow and depression of spirits; in that general exhaustion the result of a close attention to business, protracted study, or the indulgence of the depressing passions; in chronic laryngitis and bronchitis; in some forms of dyspepsia, and in engorgement of the abdominal viscera. Moreover, it has a special reputation for the alleviation of chlorosis, and for many forms of uterine derangement, marked by an entire absence, or a difficulty in the performance, of the catamenial function.

SIRADAN—a bathing establishment of the *Hautes-Pyrénées*, is situated in a fertile valley not far distant from Bagnères-de-Luchon, on the road to Toulouse, and scarcely

a mile from the village of *Sainte-Marie*. It possesses two mineral springs, collected into a small bathing establishment, with an hotel adjacent for the reception of visitors. The waters are in all respects nearly the same as those of Sainte-Marie.

SYLVANÈS—a village of the department of *Aveyron*, in the south of France, contains three thermo-chalybeate springs, of a temperature varying between 93·20 and 100·40. These waters are employed by those in the vicinity in cases of general debility as internal remedies, and externally, in the form of baths, in cases which indicate a necessity for the stimulating action of the natural hot baths.

TARASCON—a small town, and capital of a canton, in the department of *Ariége*, south of France, is situated in a valley through which the river *Ariége* passes, at a distance of six miles from the town of Foix. It is possessed of an acidulated ferruginous spring named *Fontaine Rouge*, which yields a considerable amount of a clear, limpid, inodorous water. It contains the chlorides of sodium and magnesium; the sulphates of lime and magnesia; the carbonate of iron, and silica. The waters of Tarascon, however, are rarely employed medicinally.

TERCIS—a village of the department of *Landes*, in the south of France, is situated in the valley of *Luy*, at a distance of less than three miles from Dax. The mineral spring of Tercis contains the chlorides of sodium and magnesium; the carbonates of lime and magnesia; the sulphate of lime, and a little free sulphur. The water is at first limpid and transparent, but subsequently covers its surface with a thin flocculent pellicle. Its temperature is 91·40. It is employed both internally and in the form of baths, in a variety of cases, including chronic rheumatism, certain forms of dyspepsia, cutaneous affections, indolent ulcers, &c.

URIAGE—in the department of *Isère*, is constructed entirely for the sake of its mineral waters, and partakes neither of the character of a substantial town nor of that of a rural village. It is simply a watering-place. It may be reached from Paris by rail as far as Grenoble, and thence by an hour's drive in a *voiture*. It contains two mineral springs, the one sulpho-saline, and the other simply chalybeate. It is to the former of these that Uriage owes its origin. Its waters are of low temperature (80·60), and require the addition of artificial heat to fit them for bathing purposes; they contain, in addition to a considerable quantity of sulphuretted hydrogen gas, the following saline and purgative ingredients:—Carbonate of lime, 3·122 grains; sulphate of lime, 22·060 grains; sulphate of magnesia, 19·141 grains; sulphate of soda, 15·623 grains; chloride of sodium, 111·700 grains, besides a trace of iodine. These waters are recommended in cases where debility is the prevailing symptom, without any obvious organic lesion. In addition to such they are likewise used in diseases amenable to sulpho-thermal springs generally; but the necessity of artificial heat to raise them to the temperature requisite for baths in such cases materially cripples their therapeutic agency.

USSAT—a village in the department of *Ariége*, in the south of France, is situated in a narrow valley on the road which connects the towns of Foix and Ax, at a distance of nine and a half miles from the latter, and at little more than a mile from Tarascon. It is built upon the banks of the Ariége. The village is well supplied with accommodation for visitors, of whom about two thousand make their way to it during the season, which extends from June to September inclusive; and the neighbourhood affords ample scope for pleasant excursions. Two springs, yielding an

abundance of water, at a temperature ranging between 91·48 and 100·40, supply the bathing establishment. The water is colourless and limpid, somewhat unctuous to the touch, and without any disagreeable odour or taste. The therapeutic effects of the springs of Ussat are not of a marked kind. In dull, phlegmatic temperaments, they produce no appreciable effects, and they are not of sufficient strength to dissipate chronic diseases of a class requiring the use of strongly stimulative mineral waters. On the contrary, they are recommended to invalids of a nervous and easily excitable temperament, especially when this is accompanied by a mal-performance of the uterine functions. They are especially useful in cases where, without any positive organic disease, there is physical and mental debility, the result of a close application to business, protracted and severe studies, or the gratification of the lower passions. In that class of nervous disorders, of which hysteria is the type, these waters are employed profitably; as also in *catarrhus vesicæ*, as well as other affections of the urinary system. Besides a trace of carbonic acid gas the waters contain the chloride of magnesium; the carbonates and sulphates of magnesia and lime; the proto-carbonate of iron; alumina; and silica, in minute quantities.

VALS—in the department of *Ardèche*, ten miles from *Aubenas*, possesses the strongest of the cold alkaline springs of France, containing an average of forty grains of bicarbonate of soda to the pint; whilst at the same time they are impregnated with free carbonic acid gas. There is little or no accommodation for invalids at Vals.

VERNET-LES-BAINS—a village of the *arrondissement* of *Prades*, in the *Pyrénées Orientales*, lies upon the north-west slope of *Canigou*, a mountain promontory stretching from the Pyrenean chain towards the north-east. It is built upon

the right bank of the river *Tet*, at a considerable elevation, and overlooks a rich and fertile valley. It is situated four miles distant from *Prades*, and sixteen from Perpignan, with which it is connected by means of the road leading from the latter place to *Mont-Louis*. The climate of Vernet is mild and equable, and the baths are available throughout the entire year. Although the village is small, the accommodation for invalids is tolerably good, and the neighbouring scenery is attractive. There are two bathing establishments at Vernet, each comprising several mineral springs. One of these, the property of two French officers, receives the name of *Etablissement des Commandants*, and is the larger of the two. It is separated from the village by the little river of *Castel*, which is crossed by a bridge constructed by the proprietors. The temperature of the water contained in this establishment ranges from 66·20 to 136·40. The other receives the name of its proprietor, and is known as the *Etablissement Mercader*. It is situated on the Castel road, at about one hundred and fifty yards distance from the village. In temperature, as well as in physical and chemical properties, the springs of Mercader resemble those of the first-mentioned waters. Both are colourless and limpid, unctuous to the touch, and of a disagreeable sulphurous odour and taste. Like all waters of this class, their first effect is to stimulate organic functions, and to impart a degree of excitation, which is agreeable to some and painful to other invalids who make use of them. In all cases they should be commenced cautiously. They are recommended in chronic affections of the membrane lining the air-passages, in certain forms of dyspepsia, and in disorders of the genito-urinary systems of both sexes. In advanced syphilitic cases, as well as in cases where mercury has been freely administered for the cure of that disease, in wounds,

especially from ulcerations, in which the cicatrices have become sluggish, and in indolent ulcers, these waters have been used with considerable benefit. Chronic rheumatism, articular as well as muscular, is likewise one of the ailments for the cure of which the waters have a reputation. The springs of Vichy are contra-indicated in active inflammatory diseases, and in persons of sanguine temperament and full habit of body. The analyses of MM. Anglada and Bouis give the following as the amount of mineral ingredients in a litre of the water:—

	Commandants.	Mercadier.
Silica.	0·139	0·216
Bicarbonate of soda.	3·010	3·533
Arseniate of soda.	0·879	1·608
Sulphate of soda.	0·448	0·277
Chloride of sodium.	0·485	0·231
Silica.	0·757	0·757
Arseniate of lime.	0·005	
Sulphate of lime.	0·046	0·077
Carbonate of magnesia.	traces	
Alumina, with traces of iron.	traces	0·015
Total in grains.	3·369	3·814

VICHY—a town of the department of *Allier*, rests upon the right bank of the Allier, in a wide and richly cultivated valley—the Limagne d'Auvergne—and surrounded by an undulating and somewhat picturesque country. From Paris the distance is accomplished in ten or twelve hours, by means of the railway as far as *Saint Germain-des-Fossés*, and thence by *coiture* for an hour and a half. Vichy consists of two parts; the old town, which presents nothing particularly agreeable or striking, and the new or *watering* town, which is separated from the former by a promenade, suitably protected by an avenue of plane trees. This section of the town is replete with accommodation for invalids

and visitors generally. Vichy is, of all French watering-places, the one most in vogue, and is visited annually by crowds of people desirous either of recruiting their health by relaxation and amusement, or of washing out some disorder with which they may be afflicted. The mineral springs are eleven in number, most of which are of tolerably high temperature, and all of them are strongly alkaline, being rendered so by the presence of bicarbonate of soda in large quantity. The following is a list of their names, taken in the order of their temperature, and showing the amount of bicarbonate of soda in each :—

	Temperature.	Bicarb. of Soda.
Celestins (Ancienne), .	57·20	78·782 grains.
Celestins (Nouvelle), . .	59·00	78·782 „
Source d'Hauterive, . .	59·00	72·318 „
Sources de Mesdames, .	62·60	61·999 „
Source du Parc, . .	71·60	75·028 „
Source Lardy, . . .	73·40	77·098 „
Lucas et Acacias, . .	84·20	77·251 „
Hôpital, ...	87·80	77·638 „
Grande-Grille, . . .	107·60	77·430 „
Puits Chomel, . . .	109·40	77·205 „
Puits Carré, . . .	111·20	77·602 „

Of these springs all except two have their origin in the town itself. The exceptions are the *Source d'Hauterive*, which escapes from the ground at a distance of rather more than five miles; and the Source de Mesdames, which, although it rises about a mile away, is nevertheless brought into use by means of pipes which conduct it to the town. The waters of Vichy are largely charged with carbonic acid gas, and to a less, but appreciable, extent with azote and oxygen. Of the following mineralising ingredients found in them by M. O. Henry, as well as by M. Lefort, bicarbonate of soda is the only one of any magnitude at all, and its

quantity has been already given, namely,—the anhydrous bicarbonates of soda, potash, lime, magnesia, strontian, lithia, iron, and manganese; the anhydrous sulphates of soda and potash; the chlorides of sodium and potassium; alkaline iodides and bromides; the silicates of soda and alumina; the arsenite of lime; the crenate of iron, besides organic matter containing free sulphur.

The waters of Vichy are limpid, inodorous, and of a not unpleasant soda-water-like taste. The first noticeable effects upon the constitution of imbibing these waters, is an alkaline condition of the urine and perspiration; a change which may remain permanent during their employment, or may only occur from time to time. Uric acid deposits are quickly dispelled by them, and on this account they are recommended in certain forms of urinary calculi, and have been known to succeed in dissolving them when composed entirely of the lithic acid variety; but it is rare that these calculi maintain a homogeneous structure throughout, so that it is scarcely to be expected that more than an occasional benefit will be derivable in these cases. In certain forms of dyspepsia, accompanied by cardialgia, and oppression at the præcordia, with abdominal distension and flatulence, these waters are frequently efficacious. In sluggish and congested conditions of the liver they are strongly recommended, imparting a tonic effect to that organ by means of their deobstruent properties; they likewise exercise the same kind of influence over all the abdominal viscera, but to a less degree. They are, moreover, employed in certain uterine maladies, as well as in others affecting the genito-urinary system generally. In chronic gout, when employed carefully during the absence of all active symptoms, they are reputed efficacious. In chronic rheumatism, in obstinate constipation, in diabetes,

in cutaneous affections, and in many other disorders, these waters are prescribed. They are contra-indicated in organic disease of the heart, in highly nervous temperaments, and in pulmonary complaints. They are employed both internally and externally in a variety of ways. The season extends from the middle of May to the middle of September.

VIC-SUR-CÈRE—in the department of *Cantal*, ten miles east-north-east of *Aurillac*, possesses cold alkaline springs, employed in disorders of the genito-urinary system, in irritation of the bowels, &c.

VINÇA—a small town, and capital of a canton in the department of the *Pyrénées Orientales*, is situated on the right bank of the river Tet, at a distance of nineteen miles west-south-west from Perpignan, and five from Prades. The mineral spring of Vinça does not yield a great abundance of water. Its temperature is about 74·30°, and its chemical and physical constitution, as well as its therapeutic influence, is much the same as that of the waters of *La Preste*.

VITTEL—in the department of *Vosges*, twelve miles south-west of Mirecourt, possesses cold saline and chalybeate springs, which have a chemical constitution analogous to those of Contrexéville, and are recommended in a similar class of cases. Vittel is not more than half an hour's ride from Contrexéville.

CHAPTER XII.

GERMANY—BELGIUM—SWITZERLAND: SUMMER RESORTS.

For a lengthened description of the topographical features of the places about to be mentioned, as well as for suitable information respecting the means of reaching them, the domestic comforts of their various hotels and bathing establishments, &c., the author can only refer the reader to the many very accurate guide-books for the countries whose names stand at the head of this chapter. The following remarks must necessarily be brief, and they are intended merely to impart a general knowledge of the medicinal qualifications of the various mineral waters.

Aix-la-Chapelle—a frontier city of Rhenish Prussia, lies at a distance of forty miles west-south-west from Cologne, on the railway which connects the latter city with Liège. The mineral waters of Aix-la-Chapelle, somewhat in the manner of the city itself, have passed through remarkable vicissitudes of fortune, but have at length acquired a settled reputation, on account of which large numbers of travellers are annually attracted to the spot. The springs make their appearance within the town itself, and are seven in number, six of which belong to the sulpho-thermal and one to the cold ferruginous class. The sulphurous springs, according to their position, are divided into *upper* and *lower*. To the

former belong the Spring of the Emperor, and those of Büchel and Saint-Quirin, the first two of which have the same origin, and rise at a temperature of 131°, the third having a temperature a few degrees lower. To the latter belong the Rose Bath, the spring of Saint-Corneille, and that of the *Buveurs;* they differ but little from those previously mentioned in point of taste and odour, but they are not so strongly impregnated with mineralising ingredients, and their temperature varies from 111·20 to 116·60. The Spring of the Emperor, according to Liebig, contains the following mineralising principles in a quart of the water:—Sulphuret of sodium, 0·139 of a grain; chloride of sodium, 40·725 grains; and of alkaline bromo-iodurets, 0·061 of a grain; besides a certain amount of silica, a trace of iron, and an organic substance.

The sulphurous waters of Aix-la-Chapelle, administered in doses of three or four glasses, exercise the usual diuretic and diaphoretic effects; but it is in the form of baths that they are more commonly employed in the various establishments which the several springs supply. The baths are rarely recommended at a higher temperature than from 93° to 97°, the *douche* being usually employed in cases requiring a more energetic application than that of the ordinary warm bath. A cautious administration of the waters in any form is deemed imperative, since they are endowed with a powerful medicinal influence. It was formerly the custom to practise blood-letting in a variety of ways, as an adjunct to the therapeutic action of the mineral waters; but happily this mischievous interference is now much less frequently resorted to.

The disorders for the alleviation of which the waters of Aix-la-Chapelle are recommended are sufficiently diverse. In chronic cutaneous affections, from the simplest form of

eczema to the most inveterate variety of herpes; in chronic ulcers and gunshot wounds, in diseases of the osseous system, in chronic rheumatism and gout, in obstinate cases of syphilis, especially where combined with the pernicious effects of mercurialisation, in uterine affections, as well as in many other forms of disease, these waters have a curative reputation.

ALTWASSER—at forty minutes' distance from Salzbrunn, in Prussian Silesia, is possessed of cold acidulated ferruginous springs, which are occasionally administered in the form of baths of different kinds, but especially as internal remedies. These waters are frequently given in combination with those of Salzbrunn, which they surpass in activity. They are recommended in cases of general atony and debility of the system, in which the exhibition of chalybeates is indicated.

BADEN (*Austria*)—the *Aquæ Pannonicæ* of the ancients, is a small but picturesque village situated on the Schwechat, at a distance of fifteen miles south-south-west from Vienna, with which it communicates by means of the railway between the Austrian capital and Trieste. The mineral springs (the ancient *Thermæ Cetiæ*) are somewhat analogous to those of Enghien both in their geographical relation with the capital of the country as well as in their sulphurous constitution, with this important difference, however, that whilst the water of the springs of Baden rises at a temperature varying from 95° to 104°, that of the Enghien springs is cold.

The springs and bathing establishments of Baden are numerous, and elegantly adorned, and are frequented by a large concourse of metropolitan visitors during the bathing season, the greater number of whom, however, retire to Baden rather for the sake of amusement than for the actual advantage of the baths. The constitution of the water, as

well as its medicinal influence, is much the same as that of Aix-la-Chapelle.

BADEN-BADEN (*Civitas Aurelia Aquensis*)—situated on the Oos, at a distance of eighteen miles south-south-west from Carlsruhe, is so well known as a summer resort of fashion, that it is unnecessary to dwell longer upon it than simply to mention the peculiarities of its mineral waters. The springs are numerous, and are all of the thermo-chloruretted saline variety. A few words upon the *Hauptquelle*, or Ursprung, will serve as a general description of the whole. The water of this spring rises at a temperature of 152·60. It is perfectly clear and limpid, and has a slightly saline taste. According to the analysis of Bunsen, a quart of the water contains the following mineralising principles:—Chloride of sodium, 33·200; chloride of magnesium and potassium, 2·688; sulphate and bicarbonate of lime, 5·666; and of other ingredients, 2·811; giving a total of 44·365 grains. The waters are chiefly employed in the form of baths; for it is to their caloric that their medicinal action is almost entirely attributable. When taken internally, it is customary to add a certain quantity of foreign mineral water to each dose of the Baden water, according to the nature of the case under treatment; but it need hardly be said that no confidence can be placed in any such mixtures, especially as many of the so-called foreign waters are manufactured in Baden itself. There is likewise a cold chalybeate spring, in which the iron is suspended by a peculiar organic acid, the discovery of Berzelius. Its virtues are but little known as yet. The Baden waters may be recommended where the employment of a series of simple warm baths is necessary.

BADEN—a town of the canton Aargau, Switzerland, on the left bank of the Limmat, lies at a distance of thirteen miles

north-east from Aarau, and fourteen miles north-west from Zurich. The springs of Baden were employed by the Romans under the title of the *Thermæ Helvetiæ*, and the present town occupies the site of one of Roman construction. The mineral springs are numerous, each hotel in the place being possessed of its own private source. All of them probably have a common origin, since their chemical constitution is nearly uniform, whilst their average temperature is about 122°. The water is limpid, colourless, and slightly impregnated with carbonic acid gas, its taste being sweetish at the moment of its contact with the gustatory surface, but leaving a saltish and slightly sulphurous after-taste. The waters exercise the usual effects of sulpho-thermal springs; they are chiefly used in the form of baths, together with occasional internal administration. They are recommended in a great number of diseases, of which the chronic forms of gout and rheumatism are the chief; but they are likewise employed in congestion of the abdominal viscera, and in incipient phthisis.

BILIN—a town of Bohemia, about five miles from Töplitz, possesses a cold alkaline spring, containing upwards of eighty grains of solid ingredients in a quart of the water. The chief mineralising principle is the carbonate of soda, and on that account the spring is sometimes called the "*Vichy froid.*" It is largely charged with carbonic acid gas, and is employed chiefly as an antacid.

BIRMENSTORF—a village near Baden in Switzerland, possesses cold, purgative mineral waters, which contain per quart the following ingredients:—Sulphate of magnesia, 220·677; sulphate of soda, 70·215; and sulphate of lime, 10·339 grains. They are not employed at the place itself, but are exported in considerable quantity.

BOCKLET—a hamlet of Bavaria, not far from Kissingen,

possesses several cold ferruginous springs, whose waters are strongly charged with carbonic acid gas. They are used by the invalids of Kissingen as tonics.

BORCETTE—a suburb of Aix-la-Chapelle, possesses several mineral springs of the sulphurous, alkaline, and ferruginous varieties. These waters resemble in all respects the springs of Aix-la-Chapelle.

BRÜCKENAU—in Bavaria, sixteen miles north-west of Kissingen, possesses cold acidulated ferruginous springs, of which the *Bruckenauer-Stahlwasser* is in high reputation. The waters are employed both internally and externally in cases requiring the administration of chalybeates.

CARLSBAD—a town of Bohemia, is situated at a distance of seventy miles west-north-west from Prague. It lies in a deep valley, surrounded by granitic rocks, over which dominate forest-clad mountains. The Töpel comes through the valley in winter, but in summer its bed is frequently dry. Carlsbad possesses numerous thermo-sulphated saline springs, whose temperature varies between 104° and 165°. The water is generally limpid, transparent, and inodorous; its taste slightly alkaline, and of the chicken-broth variety. The chemical composition of the different springs is identical, the only dissimilarity being in the point of temperature, so that it is probable they have a common origin. According to an analysis by Gottl of Carlsbad, a thousand parts of the water contain the following proportions of solid ingredients:—Sulphate of potash, 1·220; sulphate of soda, 1·948; chloride of sodium, 1·136; alkaline carbonates, 1·495; various ingredients, 0·165. The springs are charged with carbonic acid gas. The mineral waters of Carlsbad are generally administered internally; they exercise a slightly purgative effect, and are employed with success in the treatment of chronic enlargement of the liver, especially in

persons who have resided long in tropical countries, in cases of general congestion of the abdominal viscera, in certain cases of urinary concretions and biliary calculi, in cases of chronic gout, in diabetes, &c. Their use is contra-indicated in cases complicated with organic lesions, in cerebral affections, in the hæmorrhagic diathesis, and in constitutions tainted with syphilis.

CANSTATT—occupies a position in the midst of an agreeable and fertile plain, three miles north-east from Stuttgard, in Wurtemberg. It possesses upwards of thirty mineral springs, the temperature of which ranges from 64·50 to 60·00. Chloride of sodium is the chief mineralising principle, and exists to an extent of about twenty-five grains per pint of the water. The springs are charged with carbonic acid gas, and are employed both internally and externally, as deobstruents in the former, and as general depuratives in both methods of administration.

CHAUDEFONTAINE—upon the right bank of the Vesdre, four miles south-east from Liège, in Belgium, possesses a slightly mineralised thermal spring. It is used in the form of baths as a sedative; but beyond its elevated temperature of 92° it is of little worth in a medicinal point of view.

DRIBURG—a town of Prussian Westphalia, eleven miles east-north-east of Paderborn, possesses a chalybeate spring, strongly charged with carbonic acid gas.

EGER. [See Franzensbad.]

EMS (*Nassau*)—seven miles south-east of Coblenz, consists almost entirely of well-constructed hotels, placed against the mountains, which protect the situation from the severity of the north winds. The village is almost entirely built upon the right bank of the river *Lahn*, and enjoys a mild and equable climate, a matter of no small importance to those invalids affected with inci-

pient phthisis, who seek to derive benefit from the mineral waters which have for so long a period been held in esteem for their curative properties. A certain dampness of the atmosphere, and the early morning fogs, however, are circumstances to be guarded against. Ems is scarcely more than an hour and a half's drive from Coblenz, whence it is easily reached. The springs of Ems are numerous, and are of the alkaline variety. Only five of them are used medicinally; namely, the *Krähnchen*, whose temperature is 84·20; the *Fürstenbrunn*, 95·00; the *Kesselbrunn*, 114·80; the *Bubenquelle*, 87·80; and the *Neuquelle*, 116·60. They are all strongly impregnated with the bicarbonate of soda, and, in addition, contain small quantities of iron and of the salts of magnesia and lime. The waters are used both internally and externally, but chiefly in the former manner. They are usually drunk in the morning, at a time when the band in the garden of the Kursaal adds its enlivening strains to the general activity of the scene. The waters of the Krähnchen and the Kesselbrunn are those most used. The water for the baths is allowed to stand in reservoirs during the previous night, where it cools, and becomes glazed over with an unctuous pellicle, the result of the decomposition of certain of its salts. It was formerly the custom to enter the baths whilst the water was at a very high temperature; but now the resident physicians rarely recommend a higher temperature than from 89·50 to 93·00; and the duration of the bath, which was in other days prolonged to several hours, is never permitted at the present time to exceed half an hour. The first effects of the waters are observable in an increased diuresis and diaphoresis, with a strengthening of the vital energies; but this is subsequently followed by a singular depression of spirits, and usually attended by constipation, for

the relief of which a judicious administration of purgatives is imperative.

The mineral springs of Ems have long enjoyed a reputation for the removal of the symptoms indicative of incipient phthisis pulmonalis, as well as for the relief of invalids afflicted with chronic affections of the larynx and bronchi. It is most probable that in nearly all these cases, however, the amelioration is brought about as a secondary consequence of an improved digestion. It is scarcely necessary to add, that in confirmed cases of consumption it would be folly to trust simply to the curative agency of alkaline mineral waters of any description whatever, and in many instances their exhibition would be followed by dangerous consequences. The calmative influence of the warm bath of Ems water is recommended in many forms of nervous disorders, such as hysteria, chorea, and other varieties of constitutional complaints incidental to the female sex. The spring of *Bubenquell* has received its name from its supposed virtues in curing sterility. As being alkaline in their reaction, the waters are likewise recommended in certain varieties of dyspepsia complicated with much free acidity, in diarrhœa with perverted secretions, in the lithic acid diathesis, and in certain other affections of the bladder and kidneys; and as deobstruents in congestion of the abdominal viscera, especially of the liver and spleen. Invalids suffering from gout and rheumatism are but seldom met with now at Ems. Persons visiting Ems should be particular in selecting suitable apartments, according to the general principles laid down in a former part of this volume. Perhaps the Kursaal, which has the water immediately at hand, affords the best accommodation.

FACHINGEN—a village of Western Germany, about nine miles east-north-east from Nassau, possesses an alkaline

spring from which the waters are exported. There is no accommodation for visitors in the immediate vicinity. The water contains nearly fifty grains of the bicarbonate of soda to the quart with about forty cubic inches of carbonic acid gas.

FRANZENSBAD—a village of Bohemia, near Eger (by which name the springs are more commonly known), possesses six mineral springs belonging to the classes of cold sulphated saline and the ferruginous or chalybeate. The water issuing from these springs is cold, limpid, and sparkling, and has a piquant, saltish, and somewhat styptic taste. The most important, as well as the most ancient, of the springs is the *Franzensquelle*, situated at the entrance of the village. A quart of its water, according to Berzelius, contains 84·829 grains of fixed mineralising principles, of which the sulphate of soda forms about 50; the chloride of sodium about 20; and the carbonate of soda nearly 12; besides which, there is about half a grain of the carbonate of the protoxide of iron. This spring is charged with carbonic acid gas. At a short distance from the Franzensquelle are the *Salzquelle* and the *Wiesenquelle*, which are collected into two large buildings connected by means of a long gallery, which serves the purpose of a promenade to those who drink the waters: the former of these contains fewer saline ingredients than the latter, and little or no iron. Another spring, the Neubrunn, is remarkable on account of the large quantity of carbonic acid gas which it contains. The cold *Sprudel* spring is likewise largely impregnated with carbonic acid gas. The *Louisensquelle* is exclusively employed in the form of baths; it resembles the Franzensquelle in chemical constitution, except that it is rather more strongly impregnated with iron.

The general action of these waters is tonic and solvent.

When taken in doses of three or four glasses they increase the appetite, strengthen the digestive powers, and give an impulse to the secretory apparatus of the alimentary system, of the abdominal viscera generally, and of the genito-urinary organs; and hence they are administered with advantage in certain forms of chronic dyspepsia, in obstinate constipation and inactivity of the distal portions of the intestinal canal, as well as in anœmia, chlorosis, and several nervous disorders of females. Baths of Franzensbad water have a singularly tonic effect. Gas baths are employed here as at Marienbad; but it is especially to the celebrity of its *mud* baths that Franzensbad owes its popularity. The medium employed is rich in quality and abundant in quantity; it contains the salts of iron, soda, lime, and alumina, besides ulmic acid in considerable quantity, and several vegetable matters. The mud has a soft and greasy feel, and an extremely styptic taste. It is reduced to a semi-liquid consistence by the addition of the water of Louisensquelle, when it has the appearance "of a bread poultice stained with ink." The baths of this medium may be either universal or partial, according to the necessities of the patient. They are considered very efficacious in the treatment of anœmia, chlorosis, chronic rheumatic affections, in the dissipation of gouty deposits, in sciatica, in paralysis without organic lesion of the nervous centres, in rachitis, in old dislocations and fractures, and in certain cutaneous disorders, &c.

FREDERICSHALL—in the duchy of Saxe-Meiningen, and but a short distance from Coburg, possesses a sulphated saline spring whose waters have for several years been much exported. It is alterative and purgative in its action, giving a zest to the appetite and an impetus to the secreting functions.

GAIS—a village of Switzerland, four miles north-east from Appenzell, on the southern declivity of the Gâbris, and at an elevation of nearly 3000 feet above the level of the sea, is the most celebrated of the watering-places at which the *whey-treatment* is practised. Near it are also the establishments of *Gonthen, Heinrichsbad,* and *Weissbad,* where also the same therapeutic agent is largely employed. The air of Gais is keen and invigorating, and is suited to a certain class of invalids; whilst the milder climate of Weissbad is better adapted to others. The milk of cows, asses, and goats, is alike used. The treatment is chiefly recommended to phthisical patients and to those suffering from obstruction of the abdominal viscera.

GASTEIN—an Austrian village about fifty miles south of Saltzburg, is situated at the extremity of a most beautiful valley at an elevation of not less than 3200 feet above the level of the sea. Independent of the natural attractions which charm the passing traveller, Gastein is endowed with one of the most extraordinary of the German mineral springs. It belongs to the thermo-alkaline order. This spring, for it is but one in point of chemical constitution, makes its appearance in six different situations at a temperature varying from 89·60 to 120·20. The names of the different springs, as they make their appearance from the ground, are:—The Chateau, the Prince, the Doctor, the Surgeon, the Baker, and the Grand Spring. There are four principal bathing establishments besides many private baths. The water of Gastein makes its exit from the ground in a noiseless manner, and without any emission of gas; it is of brilliant purity, inodorous and tasteless; and when left to stand for several hours yields no deposit. Analysis has thrown but little light upon its chemical constitution, and it appears to be scarcely more than an agreeable

GEILNAU—in the duchy of Nassau, possesses a cold acidulated alkaline spring similar to that of Fachingen on the opposite side of the *Lahn*.

GLEICHENBERG—not far from the town of Gratz, in Styria, possesses several gaseous alkaline springs, of a temperature varying between 59·00 and 62·60. The waters are charged with carbonic acid gas, and contain, as their principal mineralising ingredient, the bicarbonate of soda to the extent of about forty grains per quart. They are similar to those of Ems and Salzbrunn in chemical constitution, and, like them, are recommended in certain pulmonary, bronchial, and laryngeal affections.

HEILBRONN—a short distance from Munich, possesses a cold bromo-ioduretted and acidulated saline spring, similar to that of Kreuznach.

HOMBURG—the capital of the landgraviate of Hessen-Homburg, is situated nine miles north-north-west of Frankfort-on-the-Maine. It occupies an agreeable situation at the eastern termination of the Taunus, and it is to its natural attractions and constant gaiety that it owes its reputation, rather than to the qualifications of its mineral springs, which are of a very common order. Homburg is now connected with Frankfort by means of a railway. The mineral springs are five in number, and belong to the cold chloruretted saline variety. They are largely impregnated with the chloride of sodium, and contain, moreover, the chloride of magnesium, carbonate of lime, and carbonate of iron in small quantity. The waters are administered only internally, and are recommended in abdominal affections generally, from simple dyspepsia to complicated cases of visceral obstruction; and likewise in cases of hypochondriasis, attended by derangement of the alimentary system. In general terms, they are purgative and alterative in their medicinal action.

ISCHL—a fashionable watering-place of Upper Austria, in the Salzkammergut, occupies an attractive position in a valley surrounded by mountains clothed in richest verdure. It is so placed in respect of the mountains as to be protected from the cold north winds, which sometimes blow with great violence; and although situated at an elevation of about 1650 feet above the level of the sea, it enjoys a mild and equable climate, scarcely inferior to that of some of the most favoured countries. To the many natural attractions which it possesses, Ischl probably owes its celebrity, rather than to any superiority of its mineral waters; for in truth it has only a strong *brine* spring, whose waters are more powerfully impregnated with saline ingredients than the sea itself, and which cannot be employed even in the form of baths without considerable dilution. The *whey* treatment is much in vogue at Ischl, the remedy being used both internally and externally. Amongst the invalids who visit Ischl, the female sex preponderates, the climate as well as the whey treatment being held in reputation for the cure of certain nervous disorders, especially when combined with the scrofulous cachexia. Certain uterine affections are likewise believed to be capable of amelioration by a residence there. Phthisical patients frequently seek relief from their malady in the balmy air of Ischl, as well as by the therapeutic agents employed there. Over the entrance to the *Kurhaus* is the inscription, *In sale et in sole omnia consistunt;* but it has been very properly suggested that the *sun* might have been placed before the *salt*, without much risk of injuring the reputation of the latter.

KISSINGEN—a watering-place of considerable reputation in Lower Franconia, Bavaria, is situated in a fertile valley, through which the *Saale* wends its way, at a distance of thirty miles north-north-east from Würtzburg. It possesses

springs of powerful medicinal action belonging to the cold chloruretted saline variety. The principal of these are three in number, the Ragoczy, the Pandur, and the Maxbrunnen, the temperature of whose waters varies from 50° to 52°. The Ragoczy is the one held in highest esteem; its water is perfectly limpid and inodorous, and has a slightly acidulo-saline taste, which becomes bitterish as the impression wears away. After exposure to the air, it deposits a yellowish-red sediment, due to the presence of iron. According to Liebig, a quart of the water contains the following solid ingredients:—Chloride of sodium, 81·359; chloride of potassium and magnesium, 16·978; carbonate of lime, 21·406; carbonate of iron, 0·910; sulphate of magnesia and lime, 22·719; and of various other ingredients, 2·466 grains. The water is likewise largely impregnated with carbonic acid gas. The Pandur has a similar chemical constitution to that of the Ragoczy, but it is not quite so strongly mineralised, nor so largely impregnated with carbonic acid gas. The Maxbrunnen, although but very slightly mineralised, contains the largest per-centage of carbonic acid gas. The waters are chiefly administered internally, and are taken early in the morning, and again, but to a less extent, in the evening. The dose varies from two or three, to six or eight tumblers at each period. The curative properties of the Kissingen waters depend upon their purgative and alterative action; they are strongly saline, and largely impregnated with carbonic acid gas, and from this must be inferred the class of cases to the treatment of which they are applicable. The *Soolensprudel*, a spring rising at a short distance from Kissingen, close by the Saale, has a temperature of 64·40, and is powerfully mineralised with nearly the same ingredients as those previously given, but it is more densely charged with carbonic acid gas.

KREUZNACH—a town and watering-place of Rhenish Prussia, is situated in the valley of the Nahe, at a distance of eight miles in a southerly direction from Bingen. The valley of the Nahe enjoys a mild and salubrious climate. The mineral waters of Kreuznach belong to the cold, bromo-chloruretted, saline variety, and resemble very much, both in chemical constitution as well as in physical and medicinal properties, common sea-water. The bulk of the waters are employed in the manufacture of *bromine*, which is exported in large quantities from Kreuznach; and a considerable quantity of the *mother-liquor* is likewise sent abroad for the use of invalids who have not the opportunity of journeying to the baths. The baths at Kreuznach are usually administered at a lukewarm temperature, and their mineral strength is increased by the addition of a certain proportion of the concentrated fluid known as the *mutter-laüge;* that is, the refuse bittern which is left after the manufacture of the salt.

The principal springs of Kreuznach are the *Elizabeth*, the *Carshalle, Theodorshalle*, and a fourth which supplies the Urania Hotel. The Elizabeth spring is the only one used as a drinking water; it rises in the southern extremity of the Nahe Island at a temperature of 48·20, and contains the following quantity, in grains, of mineralising ingredients per pint:—Chloride of sodium, 72·80; chloride of calcium, 13·30; chloride of magnesium, 4·00; chloride of potassium, 0·5; chloride of lithium, 0·5; bromide of magnesium, 0·27; iodide of magnesium, a trace; besides several other salts in very minute quantity. The Kreuznach waters are chiefly administered in the form of baths, drinking being resorted to only when a purgative and slightly alterative effect is desired. Indeed, there is, I believe, no benefit derivable from them which may not be procured in a more agreeable

manner by ordinary sea-bathing, or by warm baths of sea water.

KRONTHAL—near Soden (Nassau), possesses cold ferruginous springs, of which the principal are the *Stahlquelle* and the *Wilhelmsquelle*. They rise close to each other at the foot of the mountain upon which stands the town of Kronberg. The waters are strongly charged with carbonic acid gas, and contain, in addition to the carbonate of iron, a considerable quantity of the chloride of sodium and magnesium. The waters are administered internally, as a somewhat stimulating tonic.

LAVEY—close to Saint-Maurice, in the *Canton de Vaud*, Switzerland, possesses a slightly sulphuretted thermal spring, whose waters rise at a temperature of 105°. Apart from its elevated temperature,—and even that is reduced considerably during its transmission through pipes to the bathing establishments,—the water of Lavey would have but a slight medicinal effect were it not increased by the addition of a certain proportion of the *mother-liquor* from the salt works of Bex. With this strongly saline adjunct it assumes qualifications similar to those of the waters of Ischl and Kreuznach, or of warm sea water, and is administered successfully in the scrofulous diathesis, &c.

LEUKEN (*Lœche*)—at the foot of the Gemmi, in Switzerland, and at an elevation of 5000 feet above the level of the sea, possesses several thermo-saline springs whose average temperature is 123·80. The water is but slightly gaseous, inodorous, perfectly limpid, and tasteless. A quart of it contains the following amount, in grains, of mineralising ingredients:—Sulphate of lime, 26·646; sulphate of soda and magnesia, 5·527; carbonate of iron, 0·154; and of other salts, &c., 0·339. According to Dr Payen, a trace of arsenic may likewise be discovered in it, but no sulphur. There

are five establishments in which the baths are administered, the waters being rarely taken internally. The method of treatment by baths at Leuken is the most disagreeable of any I have ever witnessed. Several persons occupy the bath (of which there are generally four in each establishment) at the same time and for several hours in succession. Each person is clothed in a bathing gown, and has a floating table, upon which may be seen either food, writing material, chess-men, books, sewing or knitting apparatus, according to the habits and inclination of the bather. It is customary to enter the bath at an early hour in the morning, and to remain, at first, for an hour or two, gradually increasing the duration of the bath until it reaches a maximum of from five to seven hours. The patient is then removed to bed, and in the evening undergoes a second bath during a shorter period. On the twelfth, or from that to the fifteenth day, the desired result of this prolonged soaking is effected. It is commonly preceded by tolerably severe constitutional symptoms, after which it makes its appearance in the form of an eruption which covers the entire body, except the hands and face. The patient at this time frequently suffers intense pain, which is gradually relieved during the maturating stage. The eruption eventually dies away, the withered scales are washed off, and the cure is supposed to be completed. The process usually occupies from twenty to five-and-twenty days. Sometimes the *poussée* is more severe than anything I have above mentioned; *Dr Constantin James*, who has had great experience of mineral waters, describes the extreme to which bathing at Leuken is sometimes carried, in the following terms :—"*Il y a des cas, heureusement fort rares, où la poussée prend de telles proportions, que la peau se distend, se fendille et même se crevasse : les plaies qui en resultént laissent suinter une*

matière âcre et brûlante, qui fait cruellement souffrir les malades, surtout pendant la nuit. Des fomentations avec des compresses imbibées d'eau thermale sont le meilleur calmant; j'ai vu aussi des personnes, arrivées au point de ne plus savoir quelle attitude prendre, n'éprouver de soulagement qu'en se faisant porter au bain."

The list of diseases in the cure of which such treatment is reputed efficacious, contains, amongst others, the following:—The lymphatic and scrofulous diathesis; a variety of cutaneous disorders; chronic wounds and ulcers, especially of the varicose description; syphilitic cachexia; gout; rheumatism, &c.

LIEBENZELL (*Wurtemberg*)—twenty-four miles west from Stuttgart, on the Nagold, possesses thermo-saline springs, which, although more strongly impregnated with mineralising principles than those of Wildbad, are generally considered to be less powerful in their medicinal effects.

LIPPSPRINGE—a town of Prussian Westphalia, thirty-six miles south-south-west from Minden, near the source of the Lippe, possesses cold saline springs whose waters are strongly charged with carbonic acid gas.

MARIENBAD—in Bohemia, not more than twenty miles south-south-west from Carlsbad, possesses mineral waters of the cold sulphated saline variety. The springs are seven in number, and yield a water somewhat resembling that of Carlsbad, excepting the point of temperature. The principal springs are the *Kreutzbrunn* and the *Ferdinandsbrunn*. The Kreutzbrunn is the one most in use; its water is limpid, and of a tartish piquant taste. According to Kersten, a quart of the water contains the following quantity, in grains, of mineralising ingredients:—Sulphate of soda, 59·758; sulphate of potash, 8·399; chloride of sodium, 19·066; alkaline carbonates, 20·761; besides other substances in minute

quantity, and a considerable amount of carbonic acid gas. The Ferdinandsbrunn rises at a little distance from Marienbad; its composition is like that of the Kreutzbrunn, but somewhat stronger, and consequently its medicinal action is more powerful. The springs of Caroline and Ambrose contain iron, and are strongly charged with carbonic acid gas; those of Wiesenquelle and Waldbrunn contain magnesia and lime in considerable quantity. The waters of Marienbad are administered internally, and are regarded as slightly purgative, when taken in large doses, as well as alterative and resolvent in their medicinal action. They are recommended in cases of congestion of the abdominal viscera, in biliary calculi, in gout, and in a variety of cases mostly of the same class as that for which the waters of Carlsbad are resorted to. The waters are likewise administered in the form of water baths and mud baths, the material for the latter being obtained from the Maria spring, which contains very little mineralising substance. Marienbad is considered to be the birthplace of the carbonic acid gas bath, a medium which is still a good deal in use there.

NAUHEIM—eighteen miles north-north-west from Hanau, Hessen-Cassel, possesses mineral waters of the thermo-chloruretted saline variety. The springs, which are for the most part the result of Artesian wells, are five in number, and have a temperature varying from 69·80 to 102·20. The water is clear, limpid, inodorous, and of a slightly bitterish saline taste. The Kurbrunn and the Salzbrunn are used internally, whilst the Grosser-Sprudel and Frederic-Wilhelm are employed in the form of baths; the Kleiner-Sprudel being devoted to the supply of carbonic acid gas for external use. All the springs are alike in the quality of their chemical ingredients, but they differ as to quantity. The Kurbrunn, the one whose waters are usually drunk, con-

tains about 270 grains of solid ingredients to the quart, of which nearly 220 consist of the chloride of sodium. The Salzbrunn contains rather more. It is to the mother-liquor from the salt works, however, that the chief medicinal influence proceeds. This fluid contains a large quantity of the bromide of magnesium. They are recommended in scrofulous cases generally, and are similar in their effects to the springs of Kreuznach.

PFEFFERS—a watering-place of Switzerland, in the Canton of St Gall, is situated in a deep gorge at a distance of six miles south-east from Sargans. Its waters belong to the thermo-alkaline variety; but their mineral constituency is so trifling as to have led many to doubt whether they ought to be considered of more importance than mere hot water. A quart of the water contains only the following fixed principles:—Carbonate of lime, 1·825; carbonate of magnesia, 0·293; chloride of sodium, 0·525; and other matters, 0·941 of a grain. The springs are five in number, whose temperature ranges from 95 to 96·80; the water is perfectly limpid, tasteless, and inodorous, and yields but a very trifling deposit when exposed to the air. The waters of Pfeffers are of ancient reputation, and still attract visitors in considerable numbers. They are employed both externally and internally, and are recommended in the following disorders amongst others:—Nervous affections; hysteria; tic doloureux; chorea; headaches; sciatica; gastralgia; a variety of uterine affections, and certain maladies of the genito-urinary system, especially catarrhus vesicæ, &c.

PULLNA—in Bohemia, possesses springs of the cold sulphated-saline variety. The water contains large quantities of the sulphates of soda (Glauber's salts) and magnesia (Epsom salts). They are exported, but there is no accommodation for drinking them at their source.

PYRMONT—thirty-seven miles south-west from Hanover, and capital of the principality of Waldeck, has been long celebrated for its mineral waters, which belong to the cold ferruginous variety. The Trinkquelle contains 0·848 of a grain of the carbonate of iron to the quart, and is, moreover, charged with carbonic acid gas. The water is clear, limpid, and of a slightly inkish taste. It is only administered internally. The Brodelbrunn is used in the form of baths chiefly, although its water is not disagreeable to the taste. It is like the former in composition. The waters of Pyrmont are similar to those of Schwalbach and Spa, and are recommended in cases requiring the exhibition of tonics.

SAIDSCHUTZ—in Bohemia, circle Leitmeritz, possesses springs of the cold sulphated-saline variety, which contain Glauber's salts, Epsom salts, and the nitrate of magnesia. They are not so strong as those of Pullna, which are not far distant. The springs are not frequented.

SALZBRUNN—in Prussian Silesia, five miles north of Waldenburg, possesses cold alkaline springs, which have pretty much the same medicinal action as those of Ems, so far as the chemical constituents are concerned; but whilst the waters of Ems have an elevated temperature, those of Salzbrunn are only about from 46° to 48°.

SAXON—about six miles north-east from Martigny, Switzerland, possesses mineral springs whose temperature ranges from 73·40 to 75·20. According to an analysis by M. O. Henry, the waters contain of the *ioduret* of calcium and magnesium 1·701 grains, and of the *bromuret* 0·633 of a grain per quart. They are recommended in cases complicated with the scrofulous diathesis.

SCHINZNACH—a village of Switzerland, in the canton of Aargau, is situated on the Aar, five miles south-west from Brugg. It possesses a single spring, of the thermo-saline

variety. The water is limpid and colourless, giving off a strong sulphurous odour, and of a bitterish saline and somewhat sulphurous taste. It is administered both internally and externally; but as its natural temperature is only 91·40, several degrees of which it loses in its passage to the baths, artificial heat is required. The same process is employed at Schinznach as at Leuken in order to effect the poussée, but it is never so violent. Affections of the skin, especially those of the scrofulous and lymphatic type; diseases of the osseous system; syphilisation and mercurialisation are amongst the chief of the infirmities reported curable by the waters of Schinznach.

SCHLANGENBAD—in the duchy of Nassau, six miles west-north-west from Wiesbaden, possesses tepid alkaline springs. They are eight in number, and are collected into two thermal establishments. The water is perfectly limpid, and of a temperature ranging between 80·60 and 89·60. It is both tasteless and inodorous, and is, moreover, of the most meagre mineral constitution, a quart of the water supplying only 0·015 of a grain of the carbonate of soda; 0·046 of a grain of the carbonate of lime; and 0·355 of the chloride of sodium, besides minute traces of magnesia, iron, and silica. It is to the presence of a large number of reptiles (*colubra flavescens*) in the neighbourhood, and to whose influence the vulgar attribute that peculiar velvety feeling imparted to the skin by bathing in the waters, that the place owes its name, Schlangenbad, or serpents' bath. The rich blue tinge of the water gives a peculiar white appearance to the skin whilst immersed in it, which vanishes, however, when the bather removes from the bath. The medicinal effect of the bath is decidedly calmative, and on that account these waters are recommended in cases marked by great nervous excitation; and in cutaneous diseases where

there is much irritability of the surface, as in psoriasis, pityriasis, and acne. Female complaints are generally relieved by them. The *whey treatment* is frequently combined with that of the ordinary baths at Schlangenbad.

SCHWALBACH *Langenschwalbach*—a town of Nassau, at a distance of eight miles north-west from Wiesbaden, on the Aar, possesses powerful cold-ferruginous waters. They are strongly chalybeate, and charged with carbonic acid gas; their great peculiarity being, that they maintain their ferruginous character unimpaired after a long exposure to the air. They are recommended in all such cases as require the exhibition of chalybeate tonics.

SCHWALHEIM—in Hessen Cassel, half an hour's ride from Nauheim, possesses a spring remarkable only for the quantity of carbonic acid gas which it contains. It is also impregnated with a minute quantity of iron, bromine, and iodine. It is used as an exhilarating beverage by persons of weak digestive powers, and in disorders of the uterine system which give rise to anæmia, chlorosis, &c.

SEDLITZ—in Bohemia, forty miles south-west of Pilsen, possesses cold sulphated saline springs, which are similar in constitution to those of Pullna and Saidschutz, but only of about half the strength of the former. The chief ingredient is the sulphate of magnesia (Epsom salts).

SELTERS—in the duchy of Nassau, forty miles north of Wiesbaden, on the Ems, possesses cold acidulated saline springs. The water is extremely limpid, and is charged with more than its own volume of carbonic acid gas; besides which, it contains about thirty-two grains of solid constituents in a pint. Of this the chloride of sodium makes up nineteen and a half, and the carbonate of soda nearly ten grains. Seltzer water is slightly purgative, antacid, and alterative. Upwards of two millions of bottles of it are

exported every year, and besides this an immense quantity of artificial Seltzer water is fabricated all over the world.

SODEN—a village of the duchy of Nassau, about ten miles from Frankfort and fourteen from Wiesbaden, possesses upwards of twenty springs of the cold chloruretted saline variety. The water is limpid, colourless, and of a more or less disagreeable taste, with a temperature varying from 53·80 to 75·20. It is saturated with carbonic acid gas. The strongest of the springs contains about 240 grains of solid ingredients, the greater part of which consists of the chloride of sodium. The Soden waters are recommended in chest affections, in the scrofulous diathesis, in varieties of dyspepsia, in visceral obstruction, and many other disorders which are amenable to the influence of a medicine which may be either purgative, alterative, or tonic, according to the strength at which it is taken.

SPA—in Belgium, twenty miles south-east of Liège. Peter the Great acknowledged the curative power of the waters of Spa; and so high did the reputation of this quiescent village run in the time of the continental campaigns, that a passport was granted to invalids travelling thither by the authorities of every nation, and the spot itself enjoyed the inestimable privilege of an *un*-armed neutrality. Half an hour from Pepinster, either inside or on the top of the railway carriage, brings the traveller to Spa. The valley of Wayai, through which the railway winds, is of itself not without considerable picturesqueness, and presents a good deal of the character, though less charming and diversified, of that branch of the North-Eastern line of railway which conducts from the quiet town of Pickering to the sea-coast in the North Riding of Yorkshire. Ensconced in the depths of a valley of the *Sylva Arduenna*, the little town of Spa lies hidden and

protected from the boisterous winds of the north, as well as from those of the south, by the lofty eminences which overhang it in these directions. From the *Kiosques*, dotted here and there on the acclivities and summits of these hills, a view of the surrounding country may be obtained, whilst from the same position the topography of the town is manifested in a most complete manner. The waters of Spa belong to the class of cold acidulated chalybeates, and are considered efficacious in a variety of disorders. The *Pouhon* is the only one situated within the town, the rest being scattered about in the suburbs in such a manner as is calculated to impart a good appetite to those who make their pilgrimage to the source of their favourite or prescribed beverage before breakfast. In the order of their ferruginous strength, the springs of *Barisart* and *La Geronstere* should be first mentioned; they contain the smallest amount of iron, and are least charged with carbonic acid gas; next to these come the *Groubeck, Sauvenière*, and *Tonnelets;* and finally, the *Pouhon*, strongest in mineralising principles, in the town itself. The waters are cold and limpid, without any marked odour, and of a sharp and somewhat chalybeate taste. They are recommended precisely in those cases in which a course of *steel drops* would be deemed advisable in the absence of such springs. Few places afford more agreeable resources for out-door amusements than Spa; the walks, or drives, or rides to the springs, the *al fresco* breakfasts, the agreeable society, all tend to make a sojourn at that place cheerful and engaging. And provided he were careful to avoid exposure to the cold air of the mornings and evenings, and to stand aloof from the detestable gambling-tables of the *Redoute*, an invalid suffering from simple debility might spend a season with advantage there.

TARASP—a village of Switzerland, in the canton Grisons,

on the right bank of the Inn, thirty-six miles east-south-east of Chur, and at an elevation of 4265 feet above the level of the sea, possesses several mineral springs, which rise on the left bank of the Inn near the hamlet of Vulpera. They belong to the cold acidulated saline variety, being literally saturated with carbonic acid gas. A quart of the water contains:—Of the alkaline carbonates, 89·698 grains; of the sulphate of soda, 33·171 grains; of the chloride of sodium, 58·95 grains; and of other salts in much smaller quantities, 6·870 grains. The waters are almost entirely administered internally; and their exhibition is indicated in such cases as require a course of gentle purgatives without the debilitating effects which usually accompany the administration of laxative medicines. They are purgative and tonic, and are well suited to cases of general plethora, or of congestion of the abdominal viscera, &c.

TOEPLITZ—a town and watering-place of Austria, Bohemia, sixteen miles north-west of Leitmeritz; and Schönau, an elegant village forming a suburb to it, possess eleven mineral springs of the thermo-alkaline variety. Of these, five are in Toeplitz and six in Schönau, having a temperature ranging from 78·80 to 120·20. The Hauptquelle is the hottest, and the Gartenquelle the coldest of the springs; they both have their origin in Toeplitz. The water is limpid and colourless at the moment of its issuing from the ground, but it subsequently assumes a slightly greenish hue; it is nearly tasteless and inodorous. It contains very little mineralising substance, and not by any means an amount sufficient, on chemical grounds, to account for its medicinal action. A quart of the water contains only 5·376 grains of the carbonate of soda; 0·649 of a grain of the carbonate of lime; and 0·864 of a grain of the chloride of sodium. Formerly the waters of Toeplitz

were administered only internally; they are now almost exclusively used in the form of baths. The thermal establishments are perhaps the most elegant of their kind, and are the resort of many distinguished persons. When taken at a high temperature the waters have a stimulating action, but when taken at a low temperature they are decidedly sedative, facts indicative of the importance of heat, at least in their instance. In general terms, they act upon the nervous system in a manner resembling those of Wildbad, Pfeffers, and Gastein; but in a less vigorous and more controllable manner. Of the diseases treated by the Toeplitz waters, gout stands first; nearly a third of the invalids who resort to them being of the gouty class. It is to the atonic variety of gout that these waters are best adapted; and especially cases of that kind, which have been undergoing for a prolonged period the mineral waters of other places without benefit, rapidly improve by a change to Toeplitz or Schonau. In certain forms of rheumatism; in neuralgia, and in many surgical diseases, the waters are also recommended. Prussia, Austria, and Saxony, have each large military hospitals at Schönau for the treatment of their soldiers.

Vöslau, a little town at about half an hour's ride from Baden (Austria), has two springs, from one of which proceeds a slightly ferruginous water, and from the other one of a mild sulphurous variety.

Weilbach, in the duchy of Nassau, is possessed of a spring of the cold sulphurous variety. The thermal establishment was until very lately an isolated building; but it has now two handsome hotels for the reception of bathers. The water of Weilbach is perfectly limpid, almost inodorous, and of a slightly sulphurous taste. The sulphur consists of the sulphuretted hydrogen gas, and is accompanied,

moreover, by a considerable quantity of carbonic acid gas and some azote. The waters are administered both internally and externally. In the form of baths, however, they lose their sulphurous character almost entirely, the artificial heat applied to raise them to the required temperature having the effect of driving off the sulphuretted hydrogen gas. The waters of Weilbach are recommended especially in chronic pulmonary disorders. Being of a sedative and rather debilitating tendency, they are not suited to persons of lymphatic and weakened constitution. On the contrary, they are adapted to persons of full and plethoric habit of body with a strong pulsation. Men bear their exhibition better than women.

WEISSENBURG—in the canton of Bern, Switzerland, about fourteen miles south-west from Thun, possesses mineral springs which issue from one of the rocks between which the torrent of Buntschibach has its course. The temperature of the water is about 75·20; it is quite transparent, colourless, tasteless, and inodorous. In a quart it contains 22·085 grains of the sulphates of lime, soda, and magnesia, besides other salts in minute quantity. The medicinal action of the water is said to be strikingly sedative, and as such is recommended in chronic irritable disorders of the respiratory system.

WIESBADEN—the capital of the duchy of Nassau, possesses mineral waters of the thermo-chloruretted saline variety. The *Kochbrunnen* is the only one that need be mentioned particularly, as it is almost the only one made use of by strangers, and is, moreover, the hottest and strongest of the eighteen which exist in the neighbourhood. The *Kochbrunnen* has a temperature of 118·40; it is clear and limpid, and disengages a dense cloud of vapour at its source; it has a slight odour, and a taste like that of *bad*

salt broth. There are many analyses of this spring, differing widely from one another; perhaps the following will be found sufficiently trustworthy. In a quart of the water: 113·152 grains of the chloride of sodium; 3·138 grains of the chloride of magnesium; 7·256 grains of the chloride of calcium; 0·293 of a grain of the bromide of sodium; and of other ingredients in minute quantity, 2·305 grains; together with about twenty cubic inches of free carbonic acid gas. It is chiefly in the form of baths that these waters are administered; but they are also a good deal used as an internal remedy. The baths give rise to considerable excitation, and should never be taken without proper medical advice. Besides a number of diseases, for the cure of which this class of mineral waters is usually resorted to, those of Wiesbaden enjoy a special reputation for the relief of invalids suffering from gout and rheumatism. In both cases it is in the passive or atonic varieties only that they are admissible.

WILDBAD—in Würtemberg, thirty miles W.S.W. from Stuttgart, possesses mineral waters of the thermo-alkaline variety. The springs are numerous, many of them having found their way to the surface of their own accord, whilst others are the result of artesian wells. It is sufficient to dig to a depth of from seventy to eighty feet anywhere in the neighbourhood to have a spring in any position. The waters are chiefly employed in the form of baths, and in a manner much more agreeable to the feelings of those who entertain a sense of propriety, than at most other places where bathing in common is resorted to. The temperature of the water ranges from 86·00 to 98·60. It is perfectly limpid and transparent, and nearly inodorous and tasteless. Its mineralising principles are few in number and small in quantity. A quart of the

water contains only 2·920 grains of the chloride of sodium, 1·701 grains of the carbonate of lime, and 0·926 of a grain of the carbonate of soda. Despite the feebleness of its chemical constituency, however, the water is efficacious as a therapeutic agent. Paralysis resulting from constitutional debility, where there is no organic lesion of the nervous centre, is the malady for the cure of which the waters of Wildbad are especially reputed. According to Dr Johnson, the sufferers who visit Wildbad are taken from amongst "the maimed, the lame, the paralytic, and the rheumatic."

WILDEGG—in the vicinity of Schinznach, Switzerland, five miles south-west of Brugg, possesses a bromo-iodu-retted spring, of a temperature averaging 53·60. It rises by means of an artesian well, and yields a clear, limpid water, of a saltish bitter taste, and an odour resembling that of marine plants. According to M. Laué, a thousand parts of the water contain 0·024 of iodine and 0·010 of bromine. It is administered internally, usually in combination with the baths of Schinznach, in cases complicated with the scrofulous diathesis. Two or three glasses are taken each morning.

WILDUNGEN—in the principality of Waldeck, on the Wilde, possesses mineral springs, whose waters are chiefly exported, there being very little accommodation for invalids in the village itself. The water is cold, limpid, and gaseous. It is largely charged with carbonic acid gas, to which ingredient it chiefly owes its medicinal reputation, and contains likewise some alkaline salts in small quantity, and traces of iron. Hufeland considers these springs to be available in cases of *catarrhus vesicæ*, and in the lithic acid diathesis. At least they exercise a diuretic effect.

[redacted]

in contact with the mountains which oppose its progress on that side of the island: it can then no longer retain the same quantity of aqueous particles in solution, and a copious precipitation of rain results. The yearly average fall of rain on the western side amounts to fifty inches, and the number of rainy days to 208. During about three months (March, April, and May) the winds fall upon the east coast, and prevail from the north-east and east-north-east. These winds have been long travelling overland; they are seeking rather than imparting moisture, and in these circumstances offer a striking contrast to those from an opposite direction. The average annual fall of rain on the east coast is only twenty-seven inches, and the number of rainy days not more than 165. The mean winter temperature of the west coast is 40·30, that of the east coast 38·20; the mean summer temperature of the former is 59·00, that of the latter being nearly the same. Hence, then, on the one hand we have a moist, relaxing climate, but withal genial in the cold seasons; and on the other a climate of a dry and bracing character throughout the year, but exposed during the spring months to the influence of obnoxious east winds. Now it is simply to avoid the extremes which these two classes of climate present, that the invalid seeks a winter residence either in the south coast or abroad. The south coast has the advantage of a lower latitude, and hence a higher temperature; but it will partake more or less of the characteristics of one or other of the before-mentioned coast-lines, in proportion as the place selected for a winter residence approaches one or other side of the island; at least unless the locality be favourably situated with respect to elevated land, which may act either as a barrier to the east winds or as a decoy to the rain clouds, and thus give rise to what may be termed an accidental climate. In the first

[redacted]

to considerable moisture. The mean annual fall of rain at this place is 28·926 inches. The sandy nature of the soil prevents an accumulation of water on the surface, and on this account Bournemouth offers marked facilities for out-door exercise, even immediately after a heavy fall of rain. There is ample accommodation for visitors here, and the vicinity offers agreeable promenades secluded from cold winds. Sea-bathing is practised with much ease and comfort, although the sands are not left by the tidal wave so much as in many other places. The mean annual temperature, according to observations made by the late Dr Mainwaring, is 51·00; that for the seasons being—Winter, 42·38; spring, 49·11; summer, 60·18; autumn, 51·71. As a winter residence Bournemouth presents the advantages of retirement and quietness, which few English watering-places possess, and which are so gratifying to the real invalid. He who can be content to dwell where Nature has planted a limited store of recreation, and to which Art has added but little, will find Bournemouth a mild but not relaxing climate, capable of affording a certain immunity from such meteorological vicissitudes as are hurtful to persons of delicate constitutions, and especially to those who suffer from irritable pulmonary complaints, as well as to others in whom the germs of consumption threaten a justly dreaded manifestation.

Brighton.—This resort of thousands of jaded citizens enjoys a reputation for its sanative influence to which it is scarcely needful to do more than merely allude. Perhaps the gay and festive scenes which are continually manifested in this brilliant watering-place are not such as the *real* invalid would desire; and there are many places which one ill-at-ease from bodily suffering would choose in preference to this. But where the body is suffering from

should be particularly careful against being misled by the warmth of the sun at this time of the year. The heat so imparted is widely different from the true temperature of the air, and the only way to secure themselves from the evil effects of rapid vicissitudes is to be clothed according to the indications of a thermometer kept at all times free from the sun's direct influence, and to avoid as much as possible, whilst taking out-door exercise, crossing from sunshine to shade. The class of patients to whom the climate of Brighton might be recommended in winter is that chiefly to whose sluggish vital energies a mild but invigorating atmosphere would be likely to yield an impulse; in whom the blood-making powers are deficient, and whose physical system has been reduced either by the shock of an active disease or by the wear and tear of prolonged exertions. Hence, convalescents, depressed, nervous, scrofulous, and anœmic patients may be advised to winter there with advantage; whilst, on the other hand, cases of irritable dyspepsia and general plethoric habit would receive no benefit from such a change. As a summer and autumn residence Brighton is held in high esteem, affording as it does ample accommodation for bathers, and recreation for all classes. Mineral springs are wanting in the town itself; but at Wick, a little way on the west side of it, there is a ferruginous spring which contains moreover salts of soda, lime, and magnesia, with a considerable effervescence of carbonic acid gas.

BUDLEIGH SALTERTON (*Devonshire*)—is a village situated five miles eastward of Exmouth. It has a south-easterly aspect, and is to a certain degree sheltered from other points; but it presents so little level ground for out-door exercise that it is unfitted for invalids in winter. Those who are strong enough, however, to climb the neighbouring

[redacted]

[redacted] the western coast [redacted] attention [redacted] part [redacted] has hitherto been accorded [redacted] meteorological data upon [redacted] character has been one of [redacted] reputation [redacted] is [redacted]. Nevertheless, upon the [redacted] observations [redacted] amongst whom it is right to mention [redacted] Esq. who for twelve successive [redacted] meteorological observations at Rothesay, many [redacted] to seek in Buteshire a retreat from the [redacted] of weather which had previously afflicted them [redacted]. I believe that many of the Western [redacted] will eventually come into reputation as winter climates [redacted], but at present, I think it necessary only to [redacted] to the consideration of one of that group of [redacted] which together constitute the county of Bute.

And here let me interpose a few words for the purpose of correcting a very general misunderstanding which prevails respecting the nature or quality of the climate of Buteshire generally, and which has had its origin in the mischievous application of the word "*Montpellier*," as expiscatory of its curative influence. "The *Montpellier* of Scotland," it is usually called. Never were two places more unlike in

point of climate. Montpellier has essentially a dry, irritating climate, being frequently for months at a time without a shower of rain. It stands upon an eminence, and is exposed by turns to the influence of the *Bise*, or cold, biting, north wind; to the *Marin*, an easterly and more humid wind; to the *Mistral;* to the *Sirocco;* and to the north-east winds, which blow with impetuous blasts from the neighbouring snow-clad Alps. In winter it is characteristically cold, clear, and dry; in summer it is hot and parching. Moreover, it is fitful in point of temperature, and altogether unsuited, as an invalid residence, for persons complaining of delicate chests, especially where there is the least threatening of inflammatory symptoms. Such, however, is far from being a correct representation of the climate of Bute. A more correct typical nomenclature would be to call it the Pau, Pisa, or Rome of Scotland; all of which would, however, be open to a certain measure of objection. But, in fact, Buteshire is itself archetypal of a certain kind of climate, and may be employed as the standard or criterion by which to estimate the relative value of other climates of the same class. The county of Bute lies in the Firth of Clyde, on the west coast of Scotland, between Lat. 55° 27′ and 55° 56′ N.; and Long. 4° 52′ and 5° 23′ W. Its superficial area is estimated at 257 square miles, disposed of in seven islands, of which Arran, Bute, and the two Cumbrays are the larger; the islands of Inchmarnoch, Pladda, and Holy Isle being of less significance.

Bute—the island so called—occupies a position near the point where the Firth of Clyde becomes lost in the ocean, at a distance of forty miles west from Glasgow. It possesses a variety of scenery less rugged and bold than that of the sister isle of Arran, but of a description not easily to be surpassed even by that of countries having greater

[illegible]

I have obtained the following information: The mean temperature for the year 1825 was 49·3, and that for 1835, 47·00, the mean height of the barometer being 30 inches. The mean temperature of the months was as follows, the first

figures representing that of 1825, the second that of 1835:—January, 41·3—38·5; February, 42·5—41·25; March, 43·5—41·5; April, 46·75—45·25; May, 52·5—49·5; June, 56·00—57·25; July, 62—57; August, 59·75—58·5; September, 56·5—51·75; October, 51—45; November, 40·75—41·25; December, 39·5—38·25. The mean maximum and minimum temperatures of the months in the year 1835 are here placed in juxtaposition: January, 51—20; February, 51—29; March, 54—28; April, 57—31; May, 64—36; June, 78—40; July, 74—41; August, 74—48; September, 68—38; October, 56—31; November, 53—24; December, 48—22. The wind blew from the north-west on seventy-four days in 1825, and on forty-nine in 1835; from the north, 33—47; from the north-east, 25—38; from the east, 33—38; from the south-east, 8—32; from the south, 106—71; from the south-west, 45—44; and from the west, 41—60. *Rain* fell in 1825 to the amount of 35·23 inches; and in 1835 to the amount of 39·37 inches; distributed over the months as follows, the first figures representing that of 1825, the second that of 1835: January, 3·90—1·88; February, 2·48—4·54; March, 2·04—3·23; April, 2·01—1·20; May, 2·25—4·35; June, 2·13—1·28; July, ·20—3·48; August, 2·95—3·90; September, 3·57—4·50; October, 4·88—2·93; November, 5·66—5·33; December, 3·16—2·78. The state of the weather in the same years, and in the same order, was as follows, the figures representing the number of days in each year:—Fair, 201—189; showery, 105—93; mostly wet, 55—75; snow, 4—8; calm or moderate, 322—302; smart breeze, 29—21; high wind, 12—42; stormy, 2—0.

The foregoing figures are taken as illustrative of the climate of Bute at two distinct periods, between which there was an interval of ten years. They are reduced from Mr Thom's observations, which were accurately pursued

during nineteen years; namely, from 1821 to 1839 inclusive, during twelve of which they were made every hour. From the whole of these observations, Sir James Clark has prepared an elaborate table, showing the mean results of the meteorological phenomena which occurred over that extended period. From his table I borrow the following figures. During the whole period of nineteen years the barometer never marked higher than 30·80, nor lower than 28·29; the mean height of the whole period being 29·88. The thermometer was never higher than 80·00, nor lower than 20·00; the mean of the nineteen years being 48·25. The wind blew in each year, on an average of nineteen, from the north-west on 45·75 days; from the north on 45·50; from the north-east on 35·25; from the east on 35·00; from the south-east on 14·50; from the south on 83·75; from the south-west on 60·50; from the west on 44·75. The average annual fall of rain was 38·50 inches. The year presented, on an average, 208 *fair* days; 89 *showery* days; 62·50 *mostly wet;* 5·50 on which some *snow* fell; 303·50 *calm or moderate* days; 31·50 on which there were *smart breezes;* 25·50 on which *high winds* occurred; and 4·50 that were *stormy.*

And now, let the reader kindly turn to Mr Vivian's tables, as reproduced under the head of Torquay, to which I have added the meteorology of Bute, for the sake of economising space, and he will see at a glance what relation the islands of the west of Scotland bear, in a climatological point of view, to other places whose reputation as winter resorts has long been acknowledged. He will find, that as regards the mean temperature of winter and spring, it is below that of most southern places, as was naturally to be supposed, but it is not by any means so far below them as is generally believed; whilst in summer and autumn the

heat is a great deal less. Then, as to its extreme range of temperature, Bute will be found to bear a very favourable comparison with most of the winter resorts. In respect of the number of its rainy days (including those on which only passing showers fell), it takes a very fair average with the others; as also in point of the quantity of rain that falls annually, belonging, however, in the latter respect to the humid class of climates. But the atmosphere of Bute is not usually damp in the absence of rain, and, moreover, it enjoys the great advantage of freedom from fogs. The climate of Bute is mild and equable, and somewhat moist; it is protected from the evil effects of the east winds, which are so hurtful to invalids in spring; and the general condition of the atmosphere, together with the natural arrangement of the surface of the island, afford abundant opportunities to invalids for taking out-door exercise. In a therapeutic point of view it is sedative, without being absolutely relaxing, in the cold seasons; whilst in the hot months it is decidedly cool and refreshing to those who leave inland towns to enjoy the excellent bathing which it affords. As a matter of course, patients requiring a bracing climate with a dry atmosphere should not be sent into Buteshire.

CLIFTON (*Gloucestershire*) is reputed at the present time for its topographical beauties and its mild winter climate, as it was formerly for the medicinal influence of the *hot well* which lies below it. It is a suburb of Bristol, and occupies the slopes and summit of a precipitous limestone hill, which forms one side of the gorge of the Avon, through which that river winds its way, to fall, eight miles lower, into the Bristol Channel. On the opposite side of this deep valley or cleft are the Leigh Woods, to whose rich and abundant foliage is due much of the gratifying scenery

which bears the name of Dowlais in Clifton. The town is built on the southern slope of the hill, and extends from its base near the margin of the river to its very summit, affording in the course of ascension a variety of distances which most of which the lower are warmer in winter and cooler in summer than the higher situations. Although not so well protected in winter from cold and north-easterly winds as Bath, Clifton has a southern aspect and a dry subsoil. It is one of the most substantially built towns in the kingdom, and offers to those who can bear the expense of its situation an agreeable and healthful residence. Cornwall Crescent is lower down, and consequently more protected during the cold season, but for the same reason is less eligible as a summer residence. The lower part of the town is much warmer than the upper, but is at the same time more humid and somewhat oppressive, and moreover is exposed to the influence of fogs rising from the river. During the cold seasons of winter and spring the invalid will find but little variety in the choice of locality for out-door exercise; but in summer and autumn the neighbourhood of Clifton is one of the most agreeable that can be imagined, affording walks and rides through scenery of surpassing loveliness, and yielding, especially to the student of natural history, an almost inexhaustible fund of entertainment. Clifton is favoured in respect of rain, at least from an invalid point of view. The atmospheric moisture appears to be attracted by the lofty mountains of Wales in one direction, and by those of Cornwall and Devonshire in the other, whereby the annual precipitation of rain in the neighbourhood of Clifton is considerably diminished. Another advantage to the resident invalid is the nature of the ground upon which the town stands, as well as the declivity of the site; the limestone and sand-

stone rocks, which lie immediately beneath the surface soil, yield an easy passage to the water which falls upon it, so that the ground is sufficiently dry for the purpose of walking exercise very soon after rain has ceased to fall. On the authority of W. H. Gore Langton, Esq., Sir James Clark records the following meteorological phenomena:—

	Annual.	Winter.	Spring.	Summer.	Autumn.
Mean temperature,	51·26	39·91	49·79	63·87	51·49
Quantity of rain in inches (Bristol),	32·56	8·43	5·69	9·44	9·00
Number of rainy days (Clifton),	169	45	36	41	45

In the present day Clifton is chiefly resorted to on account of its mild winter climate; but formerly its chief attraction was the Bristol Hot Well, which lies low down at the foot of St Vincent's Rock. This well yields a copious supply of water at a temperature varying between 73° and 76°, which is scarcely of sufficient height to entitle it to the name of *hot* well. Its saline ingredients consist of the muriates of magnesia and lime, the sulphates of lime and soda, and the carbonate of lime, all of which exist in comparatively small quantities. In addition to these, according to the analysis of Dr Carrick, a gallon of the water yields thirty cubic inches of carbonic acid gas. Although formerly this water was carefully bottled and despatched to different parts of the country on account of its medicinal reputation, it is now almost entirely neglected. By those who dwell at Clifton for other reasons, however, it is recommended as a pure and wholesome water, and may be taken with advantage in some forms of dyspepsia, in which the corrective influence of the fixed air is frequently beneficial. Generally speaking, it may be regarded as a good

potable water. As a winter climate, Clifton enjoys seclusion from tempestuous weather, and considerable protection from prevailing winds. The lower division of the town is warm, equable, and somewhat moist; the upper part cooler, more exposed to vicissitudes of temperature, and of a much drier character. Patients suffering from pulmonary and bronchial complaints must exercise great care, and preserve themselves as much as possible from sudden exposure in the more elevated parts of the town. In cases where there is a tendency to recurrent inflammatory attacks, with irritation of the lining membrane of the air passages, a warm littoral residence is generally considered preferable. As a summer residence, Clifton is remarkable for its healthiness, and affords not only an open, airy, and vivifying atmosphere, but likewise presents a numerous retinue of natural attractions in its vicinity, which at once secure to the visitor at this season that measure of health which invariably follows the due co-operation of an active body with a contented mind.

DAWLISH (*Devonshire*)—reclines on the opposite declivities of a picturesque valley which extends far inland from its seaward extremity at the Langstone Cliffs. The houses recede up the valley on opposite sides of the little river which flows unceasingly in the centre, whose margins are decked with evergreens, and serve the purpose of a promenade. Dawlish is resorted to both in summer and winter. As a watering-place it enjoys a tolerable reputation, and its bathing is good and commodious. The scenery around is attractive, and affords amusement to the visitor during his peregrinations through the neighbouring country. As a winter residence, Dawlish is not equal to Torquay. It rests on a gravelly soil, and therefore the ground soon dries after rain; but the quantity of rain that falls annually is con-

siderably more than that which falls at Torquay. During the winter months the temperature is mild, and varies very triflingly; but in spring the cold east wind finds access to the valley, and it is then no longer a safe locality for persons suffering from pulmonary complaints. The houses at the upper part of the valley are best adapted for a winter residence, being protected from the winds which prevail at that season, but they afford no shelter from the east winds of spring. The railway, which crosses the river near its embouchure, separates the valley from the shore.

EXMOUTH (*Devonshire*)—consists of an old and new town, the former of which lies along the margin of the river and the base of Beacon Hill, whilst the latter mounts in successive terraces to a considerable elevation above the sea level. The view from Beacon Hill is one of the finest in Devonshire, commanding as it does a view of the coast as far as Berry Head. The side of the hill is carefully laid out in agreeable walks, shaded by an ample summer foliage. The higher parts of Exmouth are exposed to all winds, and are especially subject to heavy gales from the south-west. From these and from northerly winds the lower parts are protected. The fall of rain is perhaps less here than at some other littoral towns of this district, and the water very rapidly passes off from the ground, chiefly by percolation through a somewhat porous soil. This is so far advantageous to the invalid, as it permits him to enjoy out-door exercise more frequently than would otherwise be the case. Unfortunately, however, there are not many sheltered walks for that purpose. The lower part of the town suffers slightly from fogs arising from the river. As a winter resort, Exmouth does not stand high; the weather at that season is often keen and fitful. Pulmonary complaints, at all events, are not suitable cases for this climate. In

summer it is a good deal resorted to for its bathing, which is pretty good. The most convenient time for it is at high water.

HASTINGS—in the east of Sussex, is protected in the rear by lofty cliffs ranging from 300 to 600 feet in height, and to this circumstance in its topography it chiefly owes its reputation as a winter climate. In December and the early months of the year, it is screened by these barriers from the cold north and north-easterly winds. But it is exposed to the sea, whence south-westerly gales occasionally reach the town with considerable impetuosity, and not unfrequently accompanied by rain. Hastings is deficient in exercise grounds for invalids, and the beach is broken by reefs; but the water is always clear and clean-looking, affording good bathing at certain times of the tide. The climate is mild in winter, and suitable for persons requiring a soft and equable atmosphere with comparatively few vicissitudes. It is of relaxing character, and therefore should be avoided by persons desirous of a tonic, bracing air. The lower parts of the town are the warmer, and should be selected by invalids having pulmonary or bronchial complaints. The higher parts are less relaxing, and afford a more agreeable summer residence. The annual amount of rain equals about 28·340 inches, which in other parts of Sussex would be fatal to out-door exercise; but at Hastings the prevalent clay land is overlaid with sand, through which the water rapidly percolates, so that the invalid may leave the house soon after it has ceased raining. There are several ferruginous springs in the vicinity of Hastings, which contain likewise sulphates of lime, soda, and magnesia, and a considerable amount of carbonic acid gas. Sir James Clark gives the following as the mean annual and seasonal temperature:—Annual, 50·40. Winter, 39·06;

spring, 47·46; summer, 61·77; autumn, 52·22. [See Tables under Torquay.]

ST LEONARD'S—on the Sussex coast, is situated about a mile to the west of Hastings, and partakes a good deal of the nature of its climate. The hills behind St Leonard's, however, are not so effectual in keeping out the cold winds as those around Hastings, and, besides an exposure to the south and south-west winds, it is on that account more open to the east winds, which give rise to changes of temperature not altogether suited to persons of delicate constitution. It may be regarded as intermediate between a mild and relaxing climate and that of a bracing character.

PENZANCE (*Cornwall*)—lies in Mount's Bay, between Lizard's Head and Land's End. It has an easterly aspect, and is slightly sheltered towards the west, from which quarter it would otherwise have suffered even more severely than it does from the violent gales which sweep over that part of the country. It can scarcely be said, however, to enjoy much protection from any of the prevailing winds. By referring to the tables of comparison given with Torquay, the reader will at once observe that the peculiar advantage of the climate of Penzance over that of other places is to be found in the smallness of its mean extreme range of temperature, annual, seasonal, and diurnal. In its mean annual temperature, Penzance is, in fact, only about a degree and a half higher than London; but in winter it is five degrees warmer, whilst in summer it is two degrees cooler, the greatest difference between the mean temperature of the hottest and coldest months in London being 26°, and at Penzance not more than 18°. Especially in the smallness of the diminution of temperature during the night, the climate of Penzance excels that of most winter resorts both at home and abroad. "Indeed," says

Sir James Clark, "the whole advantage of Penzance, as compared with the south of Europe, appears to occur in winter, and during the night."

In spring, the climate of Penzance is less favourable to invalids, who require a steady temperature, than that of several other places along the south coast of Devonshire, a circumstance due to its north-easterly aspect, and to its comparatively unprotected situation. The annual fall of rain at Penzance is large, when compared with the south coast generally, and its climate belongs to the humid and relaxing variety.

With respect to the gales of wind so frequent in the vicinity of Penzance, Dr Forbes, in his "Observations on the Climate of Penzance and the District of the Land's End," has the following remarks:—"During the prevalence of the south or south-west gales, there is very little difference of temperature between the day and night, as proved by the register thermometer. Sometimes there is no difference whatever; and very commonly the minimum of the night is not more than 3° or 4° below the maximum of the day. This shows how very completely the influence of the sun is excluded by the dense vapour with which the air is loaded; and during these *our moist siroccos*, we may say, without any metaphor, that we are breathing the breezes of a climate milder than our own. When these south and south-west winds, so prevalent in winter, are very gentle, the sky is often clear for many days together. On these occasions the warmth and softness of the air are truly delightful; and when taken in conjunction with the beautiful scenery around Penzance,—the calm blue bay, the gay green meadows, the myrtles and other exotic plants common in our shrubberies,—one is almost tempted to forget that it is a winter landscape that he is contemplating."

As a winter residence for invalids, Penzance has very little to recommend it beyond the steadiness of its temperature throughout the day and night. In spring, it is inferior to many places in Devonshire. In general terms, its climate is equable, but humid and relaxing in winter, and fitful in spring. Invalids of a low nervous type, suffering from atonic dyspepsia, as well as persons of a scrofulous or otherwise debilitated constitution, should avoid Penzance. In affections of the mucous membrane lining the air passages, characterised by irritability and lack of secretion, the climate may be recommended; but in other varieties, where there is copious secretion and a general relaxation of the system, it should be avoided. In advanced cases of pulmonary consumption, and indeed in any cases which have passed the threshold of the disease, Penzance is not a desirable residence. "In a good many cases, however," says Dr Forbes, "of chronic bronchitis simulating phthisis, the health was greatly improved, and in some it was completely restored from a state of great debility and seeming danger. In a few cases, also, of young persons who accompanied their diseased relatives, and in whom the hereditary predisposition was strongly marked, if there was not already evidence of nascent tubercles, a great and striking improvement in the general health and strength followed within a short period after their arrival, and seemed fairly attributable to the combined influence of change of air, scene, and habits."

QUEENSTOWN (*Cove*)—rests upon the southern acclivity of Cove Island within Cork Harbour. The town is built in successive terraces, facing the entrance of the harbour, from the water's edge to a slight elevation above it. It affords good accommodation for winter residents, and is now tolerably easy of access. The vicinity offers facilities for out-

door exercise; and in summer or autumn the invalid may make excursions to some of the finest natural scenery that can be imagined, and for which the south of Ireland is justly famous. As a winter climate, Queenstown is highly estimated. Its mean annual and seasonal temperature is almost uniform with that of Torquay, and higher than that of Penzance, the Undercliff, and Hastings. The mean extreme range of temperature is likewise considerably less than that experienced at the above-mentioned places. The average number of rainy days per annum at Queenstown is 131, at Torquay 132, at Penzance 178, at Undercliff 146, and at Hastings 153. The quantity of rain which falls yearly at the same places, and taken in the same order, is 33·25, 38·20, 44·66, 23·48, and 32·81 inches. In all these circumstances, Queenstown takes the lead in the point of view beneficial to the invalid. Its climate is marked by mildness and equability, and an absence of extreme vicissitudes. The town is well sheltered from cold winds; that from the south-west being the most frequent, and next to it the north-west; then the west, the north, the south-east, the north-east, and least of all that directly from the east. A large portion of the annual amount of rain which falls at Queenstown is precipitated during the winter months; namely, 10·54 inches, that of spring being 4·05; of summer, 7·05; and of autumn, 11·92. The winter climate is scarcely, however, more humid than that of those places already enumerated in comparison with it, if we may judge by the number of rainy days at each place during that season. At Queenstown it rains on 37 days in winter, at Torquay on 35, at Penzance on 50, at Undercliff on 39, and at Hastings on 39.

The mean annual, seasonal, and mensual temperature of Queenstown, as quoted by Sir James Clark, from observa-

tions made by Dr Scott from September 1834 to August 1841 inclusive, is as follows:—Annual, 51·93. Winter, 44·19; spring, 50·17; summer, 61·36; autumn, 52·01. January, 43·30; February, 44·45; March, 46·13; April, 49·06; May, 55·34; June, 59·97; July, 61·76; August, 62·36; September, 57·00; October, 52·03; November, 47·01.; December, 44·84.

In pulmonary and bronchial complaints, especially with irritation of the lining membrane of the air-passages, and a tendency to recurrent inflammatory attacks, the climate of Queenstown is one of the best in the kingdom. It is what may be termed a mild, equable, and slightly humid and relaxing climate. As a summer residence it is a good deal resorted to for the refreshing sea-breezes which blow upon it, and for the sake of its bathing accommodation.

SALCOMBE—lies within a creek, guarded by Prawl Point and Bolt Head, on the south coast of Devon. It is well sheltered by the surrounding uplands, and enjoys a mild and equable winter temperature. Orange and lemon trees bring their fruit to maturity in the open air in this favoured spot. But the great disadvantage which Salcombe labours under from the want of properly sheltered exercise-grounds, is almost sufficient to neutralise the beneficial effects which it would otherwise be capable of affording to invalids.

SIDMOUTH (*Devonshire*)—rests on a level with the sea, in a valley formed by the Sid. It is protected by lofty hills from the north-west, and partially from the north, the latter barrier being eked out by groves of luxuriant trees. It is open to the sea in a southerly direction, whilst easterly and westerly winds meet with impediments in Peak Hill and Salcombe Hill. The northerly wind, although it has access to a certain extent, is, nevertheless, considerably modified in its intensity by the partial opposition which

it encounters in its approach. By referring to the tables given with *Torquay*, the reader will see at a glance the relative value of Sidmouth as a winter residence, when compared with several places of reputation.

The climate of Sidmouth is mild and relaxing. Many delicate plants flower in the open air, and snow in the town itself is almost never seen, although it is not so uncommon on the summits of the neighbouring hills, at an elevation of five hundred feet. In the early months of the year the place is subject to severe storms. The houses a little distant from the sea, and somewhat elevated, are the most eligible for invalids. To naturalists, the vicinity of Sidmouth presents a profuse store of curiosities; but to the invalid who cannot bear the fatigue of searching for plants, shells, or geological specimens, it is somewhat tame. Persons suffering from pulmonary complaints, with proper care, may winter at Sidmouth in safety; but others requiring a tonic or bracing climate should certainly avoid it. It is difficult to judge between so many conflicting opinions, whether Sidmouth claims to be in higher repute as a winter or as a summer resort. In the latter season it is recommended for its bathing.

TEIGNMOUTH (*Devonshire*)—occupies a picturesque position on the bay formed by Hope's Nose on the one side and Orcombe on the other. It is a good deal frequented in summer for the sake of the bathing which it affords; and it is considered to be less relaxing at that season than many other of the southern watering-places. Its temperature is then about five degrees lower than that of London.

As a winter residence, Teignmouth presents few attractions to the invalid; nor can it be safely recommended in cases requiring a mild and steady climate. Its mean winter temperature is about six degrees higher than that of London,

but on account of its exposure it is subject to marked variations. From a work by Dr Barker, on the climate of Worthing, I have obtained the following figures respecting the meteorology of Teignmouth for the year 1858 :—For that year the mean barometric pressure was 29·937 ; the highest temperature, 78·7; the lowest, 23·8; the extreme range, 54·9 ; the mean of the highest temperature, 54·6 ; the mean of the lowest, 44·5 ; the mean daily range, 12·6 ; the mean temperature of the air, 50·6 ; mean temperature of the dew point, 44·5. Of the winds, the north blew on 117 days, the east on 97, the south on 87, and the west on 64. Rain fell on 168 days to the total amount of 24·6 inches.

TORQUAY—has for many years been the resort of invalids afflicted with pulmonary, and particularly with phthisical complaints. The town has extended widely and rapidly, and has become, in addition to being the *temporary* resort of those who seek to avoid a cold winter and spring elsewhere, the *permanent* habitation of many who have taken up their abode in the numerous elegant villas which adorn the undulating surface of the surrounding country. Torquay has a peculiar climate within a general climate. The latter, that is to say, the climate common to the south-west coast, is mild, equable, and humid ; the former, that of Torquay itself, whilst partaking of the general characteristics of Devonshire and Cornwall, is less marked in its distinctive features, and, especially, it is less moist.

Dr Shapter, in his " Climate of the South of Devon," has drawn attention to the prominent features of the climate of this locality generally, and particularly points to the relation existing between land and sea in this extremity of our country. " The character of the climate," he says, " is warm and moist, partly owing to its latitude, yet much is due to

its position as regards the ocean, forming as it does a portion of a large promontory or imperfect peninsula, projecting westward into the Atlantic, so that nearly one-half of its circumference is sea-coast. This circumstance tends also to produce an equability of temperature not common to larger breadths of land. Equability of temperature is one of the striking characteristics; the difference between the warmest and coldest of ten places amounts to but four degrees, and the mean difference of temperature of succeeding years but to one and a half." Here we have a striking likeness to the peninsula of Italy, so far as the relative position of sea and land is concerned; but whilst the vast extent of sea over which the westerly winds travel gives a dominating moisture in the one case to the climate of the country, in the other the mountains to the north afflict the adjacent lands with cold and piercing winds. Were it not for the excessive moisture of Devonshire, it would possess the *El Dorado* of climates; were it not for the varying winds of the Italian peninsula, it would offer a matchless climate to invalids for a winter residence. In both cases, latitude and local peculiarities determine the relative salubrity and sanative influence which reign in their individual towns.

As in many other instances of English wintering and watering places, my personal experience of the climate of Torquay amounts to nothing more than a general idea of what it might rationally be supposed to be from a careful observation of its topographical peculiarities made during two visits, the one of a few weeks in spring, and the other of a few days only in summer. But, thanks to the industry of many gentlemen interested in meteorology, we have better and more reliable data to proceed upon than would have been yielded by a cursory review of the place such as I could effect in so brief a time. To Edward

Vivian, Esq., of Torquay, the profession is much indebted for valuable meteorological observations carefully made through a series of years, and for some interesting tables which he has been at the trouble of compiling with a view of comparing the climate of Torquay with that of other places. From these tables, given hereafter, may be gathered the following facts, for further details of which the reader is referred to Mr Vivian's little work on "The Climate of Torquay" :—"1. That the mean annual temperature of Torquay, even at Woodfield, is higher than at any other place in Great Britain or Ireland; that this advantage is felt in the cold months, the summers being cooler than at most other places, in about the same proportion that the winters are warmer—the climate being more equable. 2. That the number of days upon which rain falls is less in Torquay than in any other place in England; and that the total amount is sixteen inches less than at Penzance, four inches less than at Clifton, and two inches below the general average. 3. That Torquay possesses a drier air than any place mentioned in the Registrar-General's report except Chichester, exceeding Brighton by nearly 3°, London by more than 2°, during the last quarter, and Clifton, on an average of years, by more than 3° annually. That the east wind is a sea breeze, an advantage peculiar to this coast. 4. That in regard to the longevity of its inhabitants, the county of Devon is inferior only to Cumberland, and above the general average of England and Wales in the proportion of 300 to 220, as shown in the number of deaths out of every thousand which occurred above the age of sixty years." Two erroneous and very prevalent ideas respecting the climate of Torquay are here controverted. It was usually supposed that because the locality is warmer in winter, therefore it must also be hotter in summer. But

we learn from Mr Vivian's tables, that whilst Torquay has a higher winter temperature than that of Clifton by 4·1, yet it is cooler in summer by 2·6; whilst it is warmer by 5° in winter than Hastings, it is lower in temperature by half a degree in summer—Queenstown, in the south of Ireland, being the only town in the United Kingdom which approximates in all seasons the temperature of Torquay. The second error discovered by Mr Vivian's tables is in respect of the annual fall of rain, which was formerly very much over-estimated from a want of proper means of observation.

I need not dwell upon the sufficiency of accommodation for visitors in Torquay; it is the end and aim of the inhabitants to provide it. The vicinity affords some very charming scenery, for visiting which, and for taking abundance of out-door exercise generally, the climate is well adapted, shelter being amply afforded from the prevailing winds, including that from the north-east, the scourge of our spring and early summer months. Although not altogether a relaxing climate, it is nevertheless far from being of the bracing type, even in its loftiest parts, and should not be recommended in cases where a tonic and invigorating atmosphere is demanded. But in complaints of the respiratory organs with a tendency to general irritability and inflammatory attacks, as well as in the early stages of phthisis, it is held in high reputation.

Dr Radcliffe Hall, in a work entitled "Torquay in its Medical Aspect," has published the results of his experience of the influence of that locality upon various forms of disease; and for a full and impartial account of the climate no better book can be consulted. As a winter resort for invalids of a phthisical tendency, Dr Hall believes Torquay to be possessed of peculiar advantages, and that provided the change to it be made at a sufficiently early stage of the

disorder, and that the invalid be content to submit to a proper course of hygienic discipline, a beneficial result may be anticipated from a temporary residence there. The first observable effect of the climate upon consumptive patients is decidedly of a sedative character, restlessness, irritability, rapidity of the circulation, and night perspirations yielding to its influence after the lapse of a day or two. This condition is usually followed in a few weeks by torpidity of the bowels, loss of appetite, and general debility, symptoms which rapidly disappear under ordinary medical treatment. As a remedial agent in other forms of disease, Dr Hall speaks of the climate of Torquay in the following terms :— "An invalid who is recovering from an attack of inflammation of the lungs, or from severe pleurisy without tubercles, experiences very similar effects from Torquay to those above stated. A gradual lessening of evening feverishness, and increased freedom of breathing, are amongst the earliest signs of benefit. . . . . In the sensitive condition of the respiratory organs which is left by an attack of bronchitis, and in cases of chronic bronchitis, the climate of Torquay is remarkably serviceable. . . . . An asthmatic invalid, meaning by this a person affected with the pure spasmodic form, is either exactly suited by Torquay or not at all. The trial is the only test. . . . . In most forms of affection of the heart, a residence at Torquay is conducive to comfort, and to the avoidance of those mischances to which a patient thus afflicted is peculiarly liable. In some instances, however, it proves unsuitable. The distinction is not difficult to make beforehand. When the patient suffers from over-impulse of the heart and difficulty of breathing on slight exertion, and a sense of obstructive oppression in the chest, particularly if the complexion be florid and the skin hard and dry, Torquay will agree. But

when the patient is pallid and flabby, frequently faintish and always feeble, the skin soft, cool, and often moist with cool perspiration; when, in short, the heart is constantly too weak, without any active irritation in the lungs, and with a low state of the general vital power, as a rule Torquay will not agree. . . . . In chronic affections of the digestive mucous membrane, Torquay proves either exceedingly beneficial, or quite the reverse, according to the nature of the case. . . . . Persons who have resided in India for a few years only are generally very well suited by this climate; and some who have spent the greater part of their lives in hot climates also select Torquay, with advantage, as their winter residence. . . . . Neuralgia, when it depends upon chronic irritation of some mucous surface, is benefited by Torquay. When, on the other hand, it is the relic of former malarial agency, this climate appears sometimes to awaken the old susceptibility of the faulty nerve. . . . . Periodical nervous headache, when not kept up by gastric or other active form of irritation, is not benefited by Torquay. The same may be said of hypochondriasis when it occurs in persons of languid circulation. . . . . Pure rheumatism, whether acute or chronic, is benefited by Torquay. . . . . Gout, when it occurs in a person of sanguine temperament, with an active habit of body and mind, is suited by this climate. The atonic forms of chronic gout and of rheumatic gout, occurring in persons of feeble habit, deficient energy of the digestive organs, and languid circulation, are not. . . . . Uncomplicated affections of the liver, affections far more rare than is generally supposed, are not suited by Torquay. . . . . There are certain forms of functional derangement for which a residence here proves very advantageous; and this is frequently one of the great advantages of the

climate for females in the earlier stages of pulmonary consumption."

The above extract, lengthy as it may appear to be, affords but a meagre idea of the amount of practical information to be obtained from Dr Hall's work. I have employed his words rather than make use of general terms, because I believe they convey the exact impressions derivable from close and prolonged observation. In a brief summary of the *modus operandi* of the climate he says :— "The modes in which it exerts its influence are due to its power of soothing the organs of respiration, circulation, and the nervous system. Its tendency is, to allay irritation of all the mucous membranes, to lessen inflammatory action in general, and consequently to relieve all the feverishness which is dependent on local inflammation; to promote a gentle action of the skin; to render the pulse slower and fuller; and to favour sleep."

The following are some of Mr Vivian's interesting tables previously adverted to :*—

Mean Temperature.

	Annual.	Winter.	Spring.	Summer.	Autumn.
Torquay (Woodfield)	52·1	44·0	50·0	61·2	53·1
Cove . . .	51·9	44·1	50·1	61·8	52·0
Penzance . .	51·8	44·0	49·6	60·2	53·3
Undercliff . .	51·3	41·8	49·6	60·6	53·5
Clifton . . .	51·2	39·9	49·7	63·8	51·4
Exeter . . .	51·2	41·4	49·5	62·0	51·9
Hastings . .	50·4	39·0	47·4	61·7	52·2
London . . .	50·3	39·1	48·7	62·3	51·3
Sidmouth . .	50·1	40·3	48·1	60·2	51·6
Chiswick . .	49·9	38·6	48·5	62·2	50·1
Nice . . .	59·4	47·8	56·2	72·2	61·6
Rome . . .	...	46·8	...	...	...
Madeira . .	64·9	60·6	62·3	69·5	67·3
Bute . . .	48·25	39·62	46·66	58·06	48·59

* I have added BUTE to these tables for reasons explained whilst treating of that place.

Mean Extreme Range of Temperature.

	Annual.	Winter.	Spring.	Summer.	Autumn.
Torquay (Woodfield)	51	29	42	30	38
Cove . . .	48	26	39	34	32
Penzance . .	49	27	33	27	32
Undercliff . .	57	29	43	35	42
Clifton . . .	59	33	44	30	46
Exeter . . .	59	29	43	36	43
Hastings . .	61	33	44	39	41
London . . .	64	32	46	48	48
Sidmouth . .	57	31	43	35	43
Nice . . .	60	32	36	29	39
Rome . . .	62	31	43	31	46
Madeira . .	31	21	22	24	25
Bute . . .	60	31	41	39	42

Average Number of Days upon which Rain falls.

	Annual.	Winter.	Spring.	Summer.	Autumn.
Torquay . .	132	35	30	32	35
Cove . . .	131	37	29	30	35
Penzance . .	178	50	40	39	48
Undercliff . .	146	39	32	33	42
Clifton . . .	169	45	36	41	45
Exeter . . .	162	42	36	41	41
Hastings . .	153	39	31	33	49
London . .	178	48	43	44	43
Sidmouth . .	141	40	33	32	35
Rome . . .	117	35	30	17	34
Madeira . .	70	23	18	6	22
Bute . . .	150	41	30	34	45

Quantity of Rain in Inches.

	Annual.	Winter.	Spring.	Summer.	Autumn.
Torquay . .	28·20	6·82	5·61	6·38	9·39
Cove . . .	33·25	10·54	4·05	7·05	11·92
Penzance . .	44·66	12·64	9·35	9·34	13·33
Undercliff . .	23·48	4·65	4·06	4·29	9·48
Clifton . . .	32·56	8·43	5·69	9·44	9·00
Exeter . . .	31·90	9·10	6·55	7·10	9·20
Hastings . .	32·81	7·59	5·80	6·40	13·02
London . . .	24·80	5·85	4·80	6·67	7·48
Sidmouth . .	22·68	5·29	5·57	5·66	7·46
Nice . . .	26·81	7·30	6·64	2·75	10·12
Rome . . .	31·11	9·49	6·29	4·16	11·17
Madeira . .	29·23	11·40	5·77	1·45	10·61
Bute . . .	38·62	10·87	7·21	8·45	12·59

ISLE OF WIGHT.—To the protection afforded by the lofty Downs, and to the peculiar retreat known as the Undercliff, on the south side of the Island, this locality is indebted for its reputation as a mild winter resort ; whilst its surpassing natural scenery renders it attractive to the summer visitor. The Island is irregularly diamond-shaped, and presents four distinct aspects, inclined respectively towards the north-east and north-west, the south-east and south-west. Its longest diameter—that from east to west—measures twenty-three miles, its average breadth six and a half, and its extreme north and south diameter thirteen miles. Concerning the towns on the north side of the Island, I do not deem it necessary to remark further than that they are usually crowded with summer visitors who find in them all that they require to recruit, by change of scenery and mental and bodily occupation, their somewhat jaded constitutions. The animated and ever changing view across the Solent adds materially to the sources of amusement for residents on this side ; and at Cowes especially, the refuge of the Royal Yacht Club Squadron, the attractions of a maritime nature are greatly increased. Bathing in all parts of the island is decidedly inferior to that of most of the watering-places in other parts of England.

But it is to the Undercliff that I wish particularly to direct the reader's attention, in referring to the Isle of Wight as a resort for invalids. This singular land-slip extends for a distance of six miles along the south-eastern aspect of the Island, between Bonchurch and Black Gang Chine, and varies in breadth from a quarter to half a mile. It is composed of irregular masses of limestone rocks formed into a series of terraces which are broken at intervals by deep fissures or *chines*. The origin of the Undercliff is due, according to geologists, to the double action of the sea from

without and the insidious influence of hidden springs within, by means of which the pedestal of blue marl, upon which the superincumbent masses rested, having been wasted away, the face of the cliff gradually, or perhaps suddenly, launched downwards and forwards to assume its present aspect, which it has maintained through at least several centuries. A strange scenic metamorphosis accompanied this remarkable movement, whereby the limited area of its operations was crowded with a diversity of landscape which, down to the present time, represents, to the ordinary tourist, its chief attraction. The lofty downs, which form the sheltering back-ground of the Undercliff, run from east to west at an elevation varying from 500 to 700 feet. They are constituted of chalk and sandstone, and are flanked on the north by the clayey structure known as the *Isle of Wight deposit*, and on the south by the upper and lower greensand, overlaid by the Wealden clay. Thus placed, the Undercliff, whilst it affords to the botanist, the geologist, and indeed to every one capable of enjoying the beauties of natural scenery, an almost inexhaustible store of entertainment, offers likewise to the invalid an immunity from many of those grievances on account of which he is compelled to resign, during inclement seasons, the comforts of his own residence. It is effectually protected from direct northerly winds as well as from those from the north-east, north-west, and west, and more or less from that arising from the south-west. But to the latter partially, and to the south, and south-east winds, the Undercliff is exposed. The capabilities afforded for out-door exercise add to the sanative virtues of this district. The nature of the soil is such as to give immediate passage to the rain which falls upon it, and otherwise to affect the atmosphere with a general dryness.

The Undercliff is raised about fifty or sixty feet above the level of the beach, which in some places it overhangs with steep cliffs, at others sloping towards it with a somewhat gentler declivity. To this elevation Sir James Clark ascribes its freedom from the strong marine atmosphere whose influence is felt in many of the watering-places in the south of England where the sea-board is low; as at Hastings particularly, where the enclosing hills behind almost completely blockade the town from landward breezes.

There is excellent accommodation for winter residents all along the Undercliff; indeed, the towns situated there owe their growth to the demand for winter quarters. The mean annual, seasonal, and mensual temperature of this sheltered spot is quoted by Sir James Clark, from the observations of Drs Crawford, Grant, and Martin, at the following figures:—Annual, 51·35. Winter, 41·89; spring, 49·66; summer, 60·63; autumn, 53·58. January, 41·46; February, 40·58; March, 44·14; April, 49·57; May, 54·27; June, 59·47; July, 60·20; August, 62·24; September, 59·59; October, 52·80; November, 48·35; December, 43·63. The mean annual and seasonal fall of rain Sir James gives as follows:—Annual, 23·48. Winter, 4·65; spring, 4·06; summer, 4·29; autumn, 9·48 inches. The tables given with Torquay show the comparative value of the meteorological phenomena observable in the Undercliff.

The climate of the south side of the Isle of Wight is such as may be resorted to by those who desire to avoid the cold spring north-easters, so prevalent in other parts of England, and to whom a mild and equable winter and spring temperature is a desideratum. To the consumptive invalid this locality presents peculiar attractions, in permitting him not only to enjoy an abundance of out-door exercise, but likewise in affording at the same time such

entertainment, by its natural attractions, as will tend in a great measure to divert his attention from dwelling too much upon his malady. Although mild, the climate is not generally relaxing, but, on the contrary, partakes somewhat of the tonic order, and in this respect offers marked advantages over many other winter climates in certain cases of bronchitis and of laryngeal affections, in which a moderate amount of astringency is both agreeable to them and essential to their recovery. In cases of children showing symptoms of a phthisical tendency, and in cases of scrofula with glandular swellings, and other caco-plastic symptoms, a winter's residence upon the Undercliff might be recommended with safety and profit. Of the genial qualifications of the Undercliff as a winter residence, Sir James Clark speaks in *ad libitum* terms of praise. Of the relation which the Downs bear to the Undercliff, he remarks:—"The defence afforded by this natural bulwark against northerly winds is, indeed, more perfect than anything of the kind with which I am acquainted in England; and the transition of climate experienced on descending from the exposure of the open and elevated down to the shelter of the Undercliff, will remind the Italian traveller of his sensations on entering the Valley of Domodossola, after quitting the chilly defiles of the Simplon in an autumn evening. You feel at once that you have entered a new climate; and the luxuriance of the vegetable tribes which you find around you, proves that the impression made on the senses has not been deceitful."

Worthing—ten miles west of Brighton, has a south-south-east aspect, overlooking the English Channel, and rests at an elevation of not more than a few feet above the level of the sea. It is sheltered from the north and north-east winds, and partly from the east and north-west winds,

by the lofty range of South Down Hills, which sweep in a somewhat semicircular form from east to west, at a distance of about a mile to the north of the town. By means of this effective barrier, the hot winds of summer, as well as the cold ones of winter, are equally opposed in their approach towards the town. Beachey Head and Selsey Bill afford partial protection from winds arriving from some of the southerly points; but to the due south and south-west winds the town is fully exposed. The soil upon which Worthing is erected consists of a rich loam overlying a stratum of sand and pebbles, beneath which is a thin stratum of chalk. It is therefore of a porous character, and readily transmits the pluvial waters.

Worthing offers ample accommodation to visitors both in summer and winter. It has extensive out-door exercise grounds in sufficiently sheltered situations, and its daily range of temperature is low. As a winter climate, it is milder than the warmer localities of Brighton, and in spring it is much more sheltered. It is subject to occasional fogs; but usually the atmosphere is clear and serene. In general terms, Worthing may be recommended in incipient phthisis where inflammatory symptoms are not of an urgent character, especially in the cases of children threatened with the disease, or where there is a manifestation of the scrofulous cachexia. In chronic bronchitis, rheumatism, spasmodic asthma,—in short, in such affections as require for their alleviation a residence in a climate neither too bracing nor too sedative,—Worthing will generally be found an agreeable and useful winter resort. In summer it is somewhat relaxing, but it presents considerable facilities for bathing, having hard and extensive sands.

Dr Barker, who has written an interesting work on the climate of Worthing, gives the following figures as part of

a series of tables, representing the meteorological phenomena observed there in the year 1859:—

Month.	Mean of Barometer.	Mean Temp.	Mean Daily Range.	Wind. No. of Days.				Rain.	
				N.	E.	S.	W.	No. of Days.	Quantity in Inches.
January .	30·215	41·8	7·5	7	2	13	9	18	0·8
February .	29·985	43·4	8·9	4	1	9	14	18	2·5
March . .	29·984	45·9	9·1	6	0	7	18	15	1·5
April . .	29·719	47·2	11·5	4	7	9	10	14	2·3
May . .	29·874	52·5	13·9	16	10	4	1	10	2·3
June . .	29·840	60·7	15·2	9	6	9	6	9	2·0
July . .	30·083	67·0	17·9	3	6	12	10	7	1·4
August .	29·868	63·0	12·9	5	6	8	12	5	0·5
September	29·874	57·4	7·3	8	6	14	2	22	3·6
October .	29·689	54·2	8·0	4	8	9	11	17	4·1
November	29·978	43·6	9·5	7	8	8	7	14	4·8
December	29·523	38·8	11·6	10	5	8	7	17	3·7
Year . .	29·885	51·3	11·1	83	65	110	107	166	29·5

CHANNEL ISLANDS.—This group of islands, the only portion of Normandy at present belonging to the British Crown, occupies a position in the English Channel not far distant from the north-west of France, with which country it is more intimately connected in a geographical point of view than with England, although, politically, it has been attached to the latter ever since the Conquest.

JERSEY—the only one which it is necessary for me to mention particularly, is the largest of the group, and is only thirteen miles distant from *Carteret*, Department *Manche*, on the north-west coast of France, and eighty-eight miles south of Portland Bill. This island is twelve miles in length, from east to west, with an average breadth of five miles, and a superficial area of 39,000 acres. Its surface is generally of an undulating character, consisting of several fertile valleys enclosed by hills of granitic and schistose formation, which

have chiefly a direction from north to south; the surface is well wooded, and preserves a perpetual freshness. The coast is rocky and precipitous, and, with the exception of St Aubin's Bay, on the east side, presents no extensive indentations. St Clement's Bay possesses eligible sands for bathing purposes. The interior of the island is divided into very small patches of well cultivated and highly productive ground; the soil consists of a sandy loam which is well manured with sea-weed. St Heliers, the chief town and port of the island, occupies a position at the eastern extremity of St Aubin's Bay, where it terminates in an open and picturesque valley. The town has greatly improved of late years, and now affords every facility for the accommodation of visitors. As a residence for invalids, Dr Scholefield raised many objections against St Heliers. Several of these had reference to the imperfect sanitary regulations, in which, however, there has recently been considerable improvement; but of its exposure to dampness and fogs his remarks are still noteworthy:—"From its southern aspect, therefore," he says, "as well as from its position at the thin margin of a wedge of land that gradually slopes down to the sea from a distance of three or four miles northward, it is not improbable that the clouds and vapours are attracted over it by the meridian sun; and are in part intercepted, on arriving at the shore, by those lofty forts that block up the town towards the sea, and that so materially obstruct the free transmission of air and the dissipation of unwholesome fogs and vapours." Dr Scholefield mentions likewise the unfavourable condition of St Heliers in respect of out-door exercise grounds. On account of these circumstances, St Aubin's, and localities to the south-west of St Heliers, are considered better adapted to invalids.

The mean annual, seasonal, and mensual temperature,

according to Dr Hooper's calculation, is as follows:—Annual, 53·06. Winter, 43·82; spring, 50·97; summer, 62·84; autumn, 54·63. January, 41·58; February, 44·62; March, 45·75; April, 50·09; May, 57·08; June, 61·31; July, 63·50; August, 63·72; September, 59·82; October, 55·65; November, 48·42; December, 45·27. The number of rainy days, although not accurately ascertained so far as I am aware, is less, according to Dr Hooper, than in the south-west of England, although the average quantity of rain in inches is probably greater. Dr Scholefield adduces the following causes of humidity in the island:—"To the production of this humidity several causes conspire. These it is important to bring under review, as being of moment in the elucidation of every part of my subject. Besides its insular position, the island is everywhere thick set with wood: every little section of ground (the property of some cottar) being hedged in with four rows of trees. The island, moreover, being continually intersected at intervals of a few hundred yards by pathways, beset with their double file of trees, planted on embankments so high as to intercept the view from the top of the loftiest carriage—after the rains of autumn have commenced, these pathways remain constantly wet during the whole of the winter; since neither can the rays of the sun penetrate, nor can currents of air freely ventilate the earth. Occasionally the trees are felled; but even then, the stocks are left so high, that, with the aid of the lofty embankments, they effectually impede all ventilation."

Jersey is exposed to every variety of wind, and is subject to frequent gales. Calm weather is comparatively rare, the word "blowy," as Dr Scholefield says, being applicable to the finest weather. Westerly winds predominate during the greater part of the year; but in the spring months the

north-easter frequently prevails, and is very injurious to the invalid. Respecting the climate of Jersey, in general terms, I shall quote one or two known authorities. Sir James Clark says:—"The climate of the Channel Islands has a close resemblance to that of the south-west coast of England, and especially to Penzance. There are the same equable temperature, the same soft humid atmosphere, and the same liability to high winds during the winter, and cold north-east winds in the spring, which characterise the latter place. So close is the affinity of their climates, and so similar their influence on disease, that the remarks which have been made on the south-west of Devonshire and the Land's End, as residences for invalids, are perfectly applicable to the Channel Islands." Dr Hooper observes:—"It may be said that the island of Jersey enjoys an early spring and a protracted autumn; vegetation being usually active and forward in March, and the landscape of the country far from naked so late as the end of December. The dreary aspect of winter, therefore, is short-lived. With rare exceptions the latter season passes off in soft or windy weather, with intervals of astonishingly mild days, and with scarcely any frost or snow. The prevailing winds of this season are the west and south-west, and the actual temperature, its variations and ranges, are all in favour of this island compared with other places in neighbouring latitudes. The season of spring is of course marked by the same unsteadiness of temperature and harsh variations of weather as in most places under a similar latitude; and this disadvantage is particularly felt in May, which often fails to bring with it the expected enjoyments. The month of March, on the contrary, is comparatively mild, and so is October."

Dr Greenhow remarks:—"The great characteristics of the

climate of Jersey are mildness and moisture. The latter is most apparent during the night, when a heavy dew falls; but during the day there is nothing to indicate its presence, as the roads dry with remarkable rapidity after rain. This night dew is very beneficent to vegetation during the summer months, when rain sometimes does not fall for two months, notwithstanding which vegetation retains its brightest green. During two years' residence I never saw a flake of snow, nor any frost which did not yield during the forenoon; and from April to October I should say fires are rarely necessary. Jersey possesses another point of superiority—the equability of the temperature during the twenty-four hours. In England a hot day is often in summer succeeded by a chilly evening, but in Jersey the chill of evening rarely admonishes one of the necessity of closing the windows."

From these quotations, conflicting though they be in many respects, the reader will be able to infer the general characteristics of the climate of the Channel Islands, as well as the kind of diseases most likely to be benefited by a residence there. Consumption, it is said, is comparatively rare in Jersey, and that on that account the locality should be regarded in a favourable light as a winter resort for phthisical patients; but when it is remembered that the climate is constantly humid, that its spring is fitful and exposed to north-east winds, and that during the whole year the island is subject to frequent gales, whilst the dryness and extent of its exercise grounds are physical circumstances of at least doubtful superiority over those in most of the winter resorts in England, it will be proper for the medical practitioner to bestow some reflection upon the matter before recommending Jersey as a winter residence to patients afflicted with pulmonary con-

sumption. Where a climate of equable temperature, but withal constantly humid, is a desideratum, Jersey may be recommended; its action upon the system will be sedative and relaxing. It is evident, therefore, that patients of a nervous, debilitated, leuco-phlegmatic constitution, afflicted with a depressing and atonic malady, especially if of a hypochondriacal tendency, ought not to be sent to Jersey, for it is the very opposite of a tonic, bracing climate, such as they usually require.

The prevalent diseases amongst the inhabitants of Jersey, according to the experience of Dr Scholefield, are—Rheumatism, chiefly chronic; hepatitis, also for the most part chronic, and generally functional rather than structural; hypochondriasis, or melancholy; dyspepsia, dropsy, and the milder forms of remittent, slow typhoid, and intermittent varieties of fever. Cutaneous diseases are likewise common; and besides these, the diseases incidental to women are constantly met with, from all of which, owing to the relaxing quality of the climate, recovery is usually slow and protracted. The inhabitants cannot bear general depletion in the treatment of their diseases, nor is such practice usually necessary, as these inflammatory disorders are seldom of a very active or sthenic type.

SUMMER RESORTS.

There are very many places in the United Kingdom to which visitors resort for a varying period during the hot months for the purpose of recruiting their physical and mental energies, after a prolonged season of unremitting toil. This season of relaxation from business or study is of the utmost importance, and should never be neglected. It is not, however, of every place of summer resort that I shall have occasion to speak here, but rather of those only which present peculiar attractions for the real invalid.

ABERYSTWITH (*Cardiganshire*)—occupies an agreeable position at the most receding depth of Cardigan Bay, close to the point where the confluence of the rivers Ystwith and Rheidol occurs. It is surrounded by hills of considerable elevation, and enjoys an agreeable summer climate. Many invalids find the refreshing mountain and sea breezes enjoyable after a sojourn in a mild winter climate. The beach presents a gentle declivity, and affords excellent bathing in a pure and transparent sea. In the neighbourhood there is a mineral spring, somewhat similar to that of Tunbridge.

AIRTHREY (*Scotland*).—The Bridge of Allan, as a watering place, owes its reputation to the neighbouring mineral springs of Airthrey. The temperature of this water varies with that of the atmosphere: early in the morning it is usually a little under 50°. The water partakes of the character of those of Cheltenham and Leamington to a modified degree. It is alterative in its medicinal effect, and belongs to the chloruretted saline variety. A pint yields on analysis:—

	Nos. 1 and 2, *Weak.*	No. 3, *Strong.*
Chloride of sodium, . . .	37·45	47·534
Chloride of calcium, . . .	34·32	38·461
Sulphate of lime, . . .	1·19	4·715
Chloride of magnesium, . .	...	0·450
Total in grains, .	72·96	91·160

ALDFIELD SPA—near Fountain's Abbey, in Yorkshire, contains but very little mineralising matter, with a slight impregnation of sulphuretted hydrogen gas. A bath, either hot or cold, may be had in a cottage hard by.

ASHBY-DE-LA-ZOUCH—possesses waters that are conducted from a spring rising at a little distance from the town. They are strongly impregnated with chloride of sodium, and belong to the class of *brine* springs. There is a comfortable hotel, in which the waters are administered in the form of baths.

ASKERN—near Doncaster, possesses sulpho-saline mineral springs. The waters contain the sulphates of lime and magnesia, the carbonates of lime and magnesia, the chloride of calcium, and a tolerably strong impregnation of sulphuretted hydrogen gas. They are used in the same class of cases as those for which the milder waters of Harrogate are employed.

BATH.—The mineral springs of Bath are the only thermal waters available for medicinal purposes in this country. They are four in number, although in all probability they originally rise from the same source, and pursue different routes to the surface, whereby they are made to present a slight difference of temperature, the more direct having the higher, and the more circuitous the lower amount of heat. The temperatures vary between 117° at the Hot Bath, and 109° at the Cross Bath. The accommodation for bathers is of the most commodious description, consisting both of capacious public and numerous private baths.

The climate of Bath is characterised by warmth and humidity, circumstances which must be taken into consideration in recommending patients to sojourn there for a season. The city is protected from the east winds which prevail in the vicinity, but it is exposed to those from the west, which bring warmth and moisture with them. The lower part of the town is warm and relaxing; it is built upon a dense clayey soil, which prevents a rapid percolation of pluvial waters; but the higher part rests upon a porous, sandy soil, and on that account, as well as from its sloping position, is much drier. In summer, the latter position should always be chosen, and in winter by all who can bear its exposure. During summer, when many resort to Bath, the heat is frequently excessive; but in autumn and winter, the true season, it is more genial. The mean annual temperature varies a little in different parts of the

[redacted]

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
Total in grains,	[redacted]

The medicinal effects of the Bath waters form the subject of so many distinct works, and their reputation has been so highly extolled, that it is impossible, within the narrow limits of a work of this kind, even so much as to mention the various diseases which are reported as having received benefit from their use. Gout perhaps stands highest in the ranks as manifesting the curative powers which they possess. In the chronic form of this disorder, and in the consequences of its previous existence, which manifest themselves late in life, the baths are employed with frequent success. Rheumatism in its chronic stages, attended with stiffness of the joints and contraction of the limbs, is usually

benefited by a course of these waters. In certain forms of paralysis, especially that so frequently met with in painters, termed "dropped hand;" in chlorosis and anæmia, and in certain chronic cutaneous disorders, these waters are used with advantage in the form of baths. They are employed occasionally also by internal administration in some forms of dyspepsia, in visceral obstruction, and especially in hepatic congestion and other chronic disorders of the liver, arising from a prolonged sojourn in tropical climates.

BEULAH—not far from the Crystal Palace, at Sydenham, possesses strong saline purgative waters. They contain, in addition to about sixty grains of the sulphate of magnesia in a pint, the carbonates of soda and lime, as well as the chlorides of sodium and magnesium, and are moreover charged with carbonic acid gas.

BUXTON—from its elevated position among the Derbyshire Hills—enjoys a bracing climate, agreeable as a summer residence, but somewhat too much exposed for the invalid in winter. The waters of Buxton, used chiefly in the form of baths in chronic gout and rheumatism, rise at a temperature of about 81°, or a little below the natural heat of the body. According to Professor Playfair's analysis, the water contains about twenty grains of solid ingredients to the gallon, in the following proportions :—

Carbonate of lime, ...	7·684
Carbonate of magnesia, ...	4·527
Sulphate of lime, ...	2·500
Chloride of sodium, ...	2·500
Chloride of potassium, ...	2·500
Silica, ...	trace
Oxide of iron, ...	trace
Total in grains, .	19·711

Its gaseous constituents consist, in the same quantity of water, of 206 cub. in. of azotic, and 3·47 of carbonic acid gas.

CHELTENHAM *Gloucestershire* —occupies a level position in the valley of the Severn near the base of Leckhampton Hill, a ridge of the Cotswold Hills. It is resorted to as a summer residence for invalids of various classes, and by many as a retreat from the toils and anxieties of active life. The mean annual and seasonal temperature is represented by the following figures :—Annual, 51·54 : winter, 40·60 : spring, 50·28 : summer, 64·32 : autumn, 50·96. It is however to the medicinal reputation of its waters that Cheltenham owes its position as a desirable summer residence for invalids generally. The best season for undergoing a course of these is that from July to October. The mineral springs of Cheltenham are numerous, and present a trifling variety, although in their chief ingredients they are alike except as to quantity ; in some there is a slight odour of sulphuretted hydrogen, probably an accidental circumstance : others are slightly ferruginous ; and in one or two, traces of iodine have been detected. The following analysis may be taken to represent the strongest spring of the *Old Well* and the strongest of the Pittville Spa springs, in a pint of water :—

	Old Well	Pittville Spa.
Chloride of sodium,	47·80	51·4
Chloride of calcium,	4·29	5·3
Chloride of magnesium,	7·30	7·5
Sulphate of soda,	59·20	14·0
Sulphate of magnesia,	...	17·1
Sulphate of lime,	...	2·1
Carbonate of lime and magnesia,	...	3·2
Hydriodate of soda,	...	0·25
Bicarbonate of soda,	...	2·4
Total in grains,	118·59	106·25

The water yields 1·16 cubic inches of carbonic acid gas per pint, with occasionally a trace of sulphuretted hydrogen. It rises at a temperature of about 50°. In general terms,

these waters are alterative, purgative, and tonic in their effects, and are available in the treatment of a variety of cases in which medicinal interference of such a kind is desirable.

CROFT—like its neighbour Dinsdale, in the county of Durham, and three miles to the south of Darlington, contains cold mineral springs strongly impregnated with sulphuretted hydrogen gas. A gallon of the water, according to Mr Walker's analysis, contains:—*Mineral:* Chloride of calcium, 19·2; sulphate of magnesia, 67·2; carbonate of lime, 64·0; sulphate of lime, 8·0—total in grains, 158·4. *Gaseous:* Sulphuretted hydrogen, 22·2; carbonic acid, 15·2; azote and carburetted hydrogen, 4·8—total in cubic inches, 42·2.

DINSDALE—is a small but prettily situated watering-place in the county of Durham, five miles south-east from Darlington. There is good accommodation for visitors at Middleton, not more than half a mile distant from the Spa. According to the analysis of Mr Walker, a gallon of the water contains the following ingredients:—*Mineral:* Chloride of calcium, 9; chloride of sodium, 17·5; chloride of magnesium, 3; carbonate of lime, 40; sulphate of lime, 145·5; extractive matter, 4—total in grains, 219·0. *Gaseous:* Sulphuretted hydrogen, 20·0; carbonic acid, 9·2; nitrogen or azote, 6·4—total in cubic inches, 35·6. This water is employed in cases where its alterative and slightly purgative effects are indicated—in certain forms of dyspepsia in biliary affections, in chronic rheumatism, and in uterine disorders in which a deficiency of blood corpuscles is also a symptom. The water is cold.

GILSLAND—is situated at a considerable elevation on the river Irthing, near the border line of Northumberland and Cumberland. It is reached by an omnibus from Rose Hill Station on the Newcastle and Carlisle Railway. The waters, to which, in common with the fascinating scenery of the

surrounding country, it owes its reputation, pertain to the sulphurous order. In addition to sulphuretted hydrogen and carbonic acid gases, they contain chloride of sodium, carbonate of soda, and other mineralising principles. Their medicinal properties are diaphoretic and diuretic.

HARROGATE—contains nearly one hundred mineral springs which have been grouped into four distinct classes—sulpho-saline; saline-chalybeate; pure chalybeate; and those containing no sulphur, and very little iron, but which are strongly impregnated with earthy salts. According to analyses conducted by Dr Hoffmann, a gallon of the water contains an amount of gaseous and solid matter equal to the following figures, the water in each case being taken from the spring whose name stands at the head of the column :—

	Old Sulphur Well.	Montpellier Sulphur Well.		Cheltenham Spring.	Sweet Spa.	Tewit Well.
		Strong.	Mild.			
GASEOUS CONSTITUENTS.						
Carbonic acid,	22·03	14·01	14·28	19·50	14·95	11·65
Carburetted hydrogen,	5·44	·53	·90	5·00	·15	...
Sulphuretted hydrogen,	26·90	25·40	5.26	...	...	...
Oxygen,	...	·48	...	1·02	·67	0·40
Nitrogen,	2·91	4·82	7·67		6·35	5·53
Total in cubic inches,	57·68	45 24	28·11	25·52	22·12	17·78
SOLID CONSTITUENTS.						
Chloride of sodium,	866·180	803·093	232·413	158·840	1·543	·280
Bromide of sodium,	trace	trace	trace	trace	...	trace
Iodide of sodium,	trace	trace	trace	trace	...	trace
Sulphide of sodium,	15·479	14·414	3·398	...	...	...
Carbonate of soda,	...	...	...	...	1·338	...
Chloride of potassium,	64 701	5·750	3·975	27·410	...	1·223
Carbonate of potassa,	...	...	...	...	·991	1·057
Chloride of magnesium,	55·693	54·667	17·140	34·027	...	...
Carbonate of magnesia,	...	...	3·251	...	3·039	2·667
Chloride of calcium,	81·735	61·910	...	51·692	...	...
Fluoride of calcium,	trace	trace	trace	trace	...	...
Carbonate of lime,	12·365	24·182	20·457	7·604	2·264	1·435
Sulphate of lime,	·182	·594	12·104	...	·307	·697
Carbonate of iron,	trace	trace	trace	4·627	·609	1·358
Carbonate of manganese,	trace	trace	trace	trace	...	trace
Ammonia,	trace	trace	trace	trace	...	trace
Silica,	246	1·846	·165	1·450	trace	1·041
Organic matter,	trace	trace	trace	·282	trace	·663
Total in grains,	1096·581	966·456	292·903	285·932	10·091	10·521

The sulphurous springs issue from the earth in the lower level or basin in which Low Harrogate is situated; whilst the pure chalybeates make their escape in the elevated plain above. According to the report made by a Commission, constituted chiefly of medical men, in the year 1854, the medicinal effects of the waters are as follows:—The strong sulphur-waters are "stimulant, aperient, diuretic, sedative, and specific." The mild sulphur-waters are "diuretic, alterative, resolvent, diaphoretic, sedative, and specific." The saline chalybeates are "stimulant, tonic, aperient, diuretic, and deobstruent." And the pure chalybeates, "excitant, tonic, and diuretic." The two former kinds, that is to say the strong and mild sulphur-waters, are administered in the form of baths and lotions as well as internally; and the two latter, the saline and pure chalybeates, besides their internal administration, are employed as lotions and collyria. The direct influence of the sulphurous springs amongst the waters of Harrogate is perhaps somewhat impeded and modified by the numerous saline ingredients with which they are complicated, and it is therefore less to be depended upon than that of some other springs in this country, and more especially than many of the continental ones. Nevertheless, these waters are employed with considerable success in the treatment of many obstinate forms of skin disease, such as herpes, lepra, psoriasis, pityriasis, and occasionally in scabies; as also in many uterine derangements, and in some forms of gout and rheumatism. The saline and chalybeate springs may be employed as alteratives, deobstruents, and gentle tonics, in chorea, epilepsy, chlorosis, and in many other diseases denoting a system below par, with a deficiency of blood corpuscles. Dr Adam Hunter, in his work on these waters, adds the following to the list of their medicinal virtues: "It speedily

prised between May and October; and the nature of the cases in which they are available varies according to the class of water employed. The saline springs are essentially purgative-alteratives, and are used in cases of derangement of the digestive functions and obstruction of the abdominal viscera. These waters are administered in most kinds of indigestion accompanied with the acidity of the *primæ viæ* and heartburn; in many disorders resulting from derangement of the secretive organs; in certain calculous diseases, and in functional derangement of the uterine system. In some cases of chronic gout these waters are successfully administered, as well as in some of the milder forms of cutaneous disorders. In other complaints marked by a deficiency of *red blood*, the ferruginous waters are useful. A pint of the water yields on analysis :—

	Saline.	Saline Chalybeate.	Sulphuretted Saline.
Chloride of sodium, . .	40·770	67	25
Sulphate of soda, . .	40·398	32	28
Chloride of calcium, . .	20·561	20	15
Chloride of magnesium, .	3·266	12	9
Oxide of iron, ...	...	1	...
Total in grains,	104·995	132	77
Gaseous contents :—			
Carbonic acid, . . .	2·103	3	3
Nitrogen or azotic, . .	0·537	...	...
Oxygen, ...	0·075	...	...
Sulphuretted hydrogen, . .	...	...	1
Total in cubic inches,	2·715	3	4

MALVERN (*Worcestershire*)—consists of two parts, *Great* and *Little*, reclining on the declivities of the Malvern Hills, a range which separates the valley of the Severn from that of the Wye, and forms the border line between the counties of Worcester and Hereford. This district is much resorted to on account of the coolness of its summer climate, and

for the richness of the surrounding scenery. The two villages lie about three miles and a half apart, the intervening space containing the Malvern waters. There are two wells at this spot, which, together, yield a sufficient supply for the use of the numerous drinkers and bathers who resort thither. The water does not appear to possess any physical characters which are not common to that of every pure and wholesome spring. According to Sir Charles Scudamore's analysis, it contains scarcely five and a half grains of solid ingredients per gallon, consisting of the carbonate of lime, the chloride of calcium, and the sulphate of soda. It has a reputation, however, for the cure of many disorders, of which scrofulous ulcers and certain varieties of ophthalmia are the chief. Although the waters may not be so strong in mineralising principles as is usual in medicinal springs, yet the scenery in the vicinity of Malvern being peculiarly attractive, forms an object of interest to all who are privileged to enjoy a few weeks of recreation during summer or autumn.

MATLOCK—is resorted to rather on account of its exquisite scenery, and for the sake of the cool retreat which it affords in the summer months, than for any virtue possessed by its tepid mineral springs. The water from these, indeed, differs but little from that of ordinary springs. It contains some free carbonic acid gas, traces of the salts of lime and soda, as well as the chlorides and sulphates of magnesia. Its temperature is not higher than 68°, and it has a specific gravity of 1·003.

MOFFAT (*Dumfriesshire*)—is situated in a broad and fertile valley, at an elevation of 582 feet above the level of the sea. It is surrounded by the Moffat Hills, which form the boundary between the counties of Dumfries to the south, and of Lanark and Peebles on the north. The highest of these is Hartfell, whose summit attains an elevation of 2685

feet above the sea. Moffat is much resorted to in summer on account of its mineral springs, of which it possesses three, two chalybeates and one sulphurous. The two former are named Hartfell Spa and Evanbridge Spa, the latter simply Moffat Well. According to Dr Garnett's analysis of the water of Moffat Well, it contains per wine gallon—

Chloride of sodium, . . .	36 grains.
Sulphuretted hydrogen, . . .	10 cubic inches.
Nitrogen or azotic gas, . . .	4 ...
Carbonic acid gas, . . .	5 ...

The gaseous constituents of this water very quickly pass off, so that no time should be permitted to elapse between the drawing and drinking of it. It is somewhat like the Harrogate sulphur-water, and, like it, is available in the treatment of lepra, psoriasis, impetigo, herpes, prurigo, &c.; as well as in many uterine derangements, hepatic affections, rheumatism, gout, &c. The Hartfell Spa may be taken as the type of the chalybeates at this place which are employed as gentle tonics. A wine gallon contains—

Sulphate of iron, ...	84 grains.
Sulphate of alumina, . . .	12 ...
Nitrogen or azotic gas, . . .	5 cubic inches.

PITCAITHLY (*Perthshire*).—Bridge of Earn owes its importance as a summer watering-place to the mineral springs of Pitcaithly. A gallon of this water contains—

Chloride of calcium, ...	170·0
Chloride of sodium, ...	114·5
Sulphate of soda, ...	6·3
Carbonate of lime, ...	5·7
Total in grains, . .	143·5
Carbonic acid gas, ...	9·5
Nitrogen or azotic gas, ...	1·5
Total in cubic inches, . .	11·0

[redacted]

swimmers. The season for visiting Scarborough extends from June to October, but delicate persons should at all times be alive to the dangerous vicissitudes of climate which occur even at this time of year at Scarborough quite as much as at other places. The mineral springs are two in number, *North* and *South*. Like the Cheltenham waters, they are aperient, alterative, and slightly tonic, and may be employed in a multitude of cases in which such medicinal action is required. The temperature of the water, as it escapes in the Spa esplanade, is 49°, but it varies slightly with the temperature of the atmosphere. Besides about seven cubic inches of nitrogen or azotic gas, the water yields by analysis the following amount of solid contents per gallon :—

	South.	North.
Carbonate of iron, . .	1·81	1·84 grains.
Chloride of sodium, . .	29·63	26·64 ...
Sulphate of magnesia, . .	225·33	142·68 ...
Sulphate of lime, . .	110·78	104·00 ...
Bicarbonate of lime, . .	47·80	48·26 ...
	415·35	323·42

STRATHPEFFER—near Ben Wyvis, in Ross-shire, is resorted to during the season, extending from May to October, for the sake of its mineral waters, which are strongly impregnated with sulphuretted hydrogen gas, being about one-third stronger in this respect than the waters of Harrogate. They yielded, to an analysis by Dr Thompson of Glasgow, the following ingredients per imperial gallon :—

	Upper Well.	Lower Well.
Chloride of sodium, ...	24·728	19·233
Sulphate of soda, ...	67·77	52·71
Sulphate of lime, ...	39·454	30·786
Sulphate of magnesia, ...	6·242	4·855
Total in grains, .	138·194	107·584
Sulphuretted hydrogen gas in cubic inches,	26·167	13·659

[redacted]

history, and presents considerable diversity in its walks and drives, many of which are richly wooded and well sheltered from cold winds. Whitby is free from that routine of balls and other gaieties to which most of the summer resorts are addicted, and therefore it is scarcely a commendable residence to those who seek renewed health by such means; but for invalids who desire to spend some weeks in quietude and repose, and who will be content with the recreations which nature has so profusely planted in its vicinity, it is well adapted. There are many chalybeate springs which trickle down the face of the cliff at intervals, to waste themselves in the beach below; but there is one in the town itself—the *Bagdale Spa*—which has been erected into a drinking fountain, and is a good deal employed for its mild tonic effects. A gallon of the water contains the following ingredients:—Sulphate of lime, 4·6323; carbonate of lime, 7·0624; carbonate of magnesia, 3·4557; chloride of potassium, 5·3006; carbonate of potassa, 0·4373; chloride of sodium, 4·2966; carbonate of protoxide of iron, 2·2769; carbonate of manganese, traces; silica, 0·3080; organic matter, 1·4630;—total, 29·2328. *Filey* and *Bridlington Quay*, to the south of Whitby, are characterised by the same unostentatious quietness, and, like it, afford a pure and bracing climate from June to September inclusive.

Filey possesses a saline chalybeate spring of considerable strength. According to Mr West's analysis, it contains, per gallon, 48·96 grains of the sulphate of magnesia, 36·40 of the chloride of magnesium, 41·20 of the chloride of calcium, 210·80 of the chloride of sodium, and 58·08 of the carbonate of soda; giving a total of 395·44 grains.

WOODHALL—in Lincolnshire, three miles west-south-west of Horncastle, possesses a bromo-ioduretted saline spring. The temperature of the water is 55°. Its medicinal action

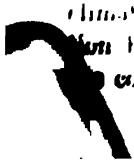
is purgative, alterative, and deobstruent, and it is especially recommended in scrofulous diseases. According to Mr West's analysis, a pint of the water contains—Of the chloride of sodium, 189·6 grains; sulphate of soda, 0·25; bicarbonate of soda, 0·75; chloride of calcium, 3·33; chloride of magnesium, 1·41; iodine, 0·15; bromine, 1·15; carburetted hydrogen gas, 0·5 of a cubic inch; of azote, 2·5, and of carbonic acid gas, 2·15 cubic inches.

CHAPTER XIV.

ITALY.

THE kingdom of Italy consists of a continent, a peninsula, and several islands. It extends from Lat. 36° 35′ to 46° 37′ N., and from Long. 6° 30′ to 18° 35′ E. On the north it is bounded by the Rhætian Alps, whence it stretches as far south as the extremity of Sicily. On the west its limit is formed by the Cottian Alps, and on the east by the extremity of Terra d'Otranto.

Of a country thus spread over several parallels of latitude, and occupying so many degrees of longitude, it is no easy matter to say, in brief terms, what may be the general characteristics of its climate; more especially since the subject is complicated by the manifestation of marked local peculiarities in its physical structure, of which at present I need only name the thoroughly irrigated plains of Lombardy, and the marshy districts around many of the cities of the peninsula, including the Tuscan *Maremma*. I have had many opportunities of witnessing both the sanative and morbific effects of the various climates which are encountered as one travels from one extremity to the other of this extensive country; and it has been my object to become acquainted with the peculiarities, in respect of weather, of all those places to which invalids are wont to



commencement of a hardier and less prolific growth.

The latter assume a different direction; they traverse the peninsula from north-west to south-east parallel with the adjacent coast-lines. The western aspect of the Apennine range differs from that of the east in presenting a more gentle declivity terminating in many localities in a low flat plain, in which the waters flowing from the mountains meet with an impediment to their onward course, and consequently tend to increase the marshy districts of the sea-board. These unhealthy swamps, especially the Maremma of Tuscany, have ever waged a deadly and successful warfare against the subjugating interference of mankind; and though somewhat encroached upon, they still maintain their desolate sovereignty. The opposite aspect, that towards the Gulf of Venice, having a more abrupt declivity, is generally, though not entirely, free from these hotbeds of disease. Next to our own country, Italy enjoys greater advantages from the proximity of a large body of water than any other part of Europe. The sinuosities of its coast-line, forming wide and capacious bays and gulfs, give to its climate a protection which can be attained by no other means, and to its landscape an unequalled charm. It is true that much of the benefit arising from the circumstance of its maritime configuration is overruled by certain noxious winds; but still there are at least a few localities which are permitted to enjoy their natural advantages uninfluenced by the undue interference of anemological vicissitudes. The geological formation of the greater part of Italy consists of tertiary and post-tertiary strata. This is especially the case in the vast basin of the Po, the upper part of the peninsula as far south as Civita Vecchia on the Mediterranean side, and the whole length between the Apennines and the Gulf of Venice on the other, besides a large portion of the island of Sicily. The

southern declivity of the Rhætian and Carnic Alps, considerable tracts of central and southern Italy, and a large part of central Sicily, are occupied by secondary strata. The loftier ridges of the Alps and Apennines consist of primary rocks, flanked on either side by limestone, sandstone, and slate. Granite occurs in the islands of Corsica and Sardinia, but seldom in other parts. Trap-rocks are encountered in limited spots near Genoa and to the north of the Po; whilst around Rome, and everywhere to the south of it, volcanic formations are abundant.

In a country otherwise so fair, it is to be lamented that the labours of its population have made so little impression on those barren tracts of land which at once deface its beauty and deteriorate its climate. The districts in which *malaria* have their origin are both extensive and widely disseminated, giving rise, at certain seasons of the year, to deplorable sickness. Malarial districts are more extensive on the west than on the east side of the Apennines, for the reason already mentioned, that on the latter side the mountain declivities are of such a character as to carry off the water flowing down their sides directly into the sea, whilst the former terminate generally in level plains intervening between the base of the mountains and the shore of the Mediterranean, in which the waters of the western aspect stagnate. They exist usually in greatest profusion along the western sea-board, in the plains between that and the Apennines, and occasionally in certain valleys ensconced between the summits of that range of mountains. The coast from Nice to the Gulf of Spezzia is free from malaria, and it is not until we reach the south of Leghorn that we meet with that wretched cast of countenance indicative of its baneful influence. Thence down to the neighbourhood of Gaeta this fever-poison enjoys an almost

undisputed sway; but beyond that we pass through a somewhat more healthy district, and do not again encounter its monstrous form, at least with any degree of severity, until we reach the southern division of the Gulf of Salerno, where we find it lurking amidst the ruins of Pæstum. The coast of Calabria, by reason of its lofty configuration, is nearly free from malaria, if we except the Gulf of *S. Eufemia*, where its presence is more strongly indicated. Along the shores of the Adriatic, the same alternations of healthy and malarial districts occur; but the latter are not so prominent as on the west side. The district around the promontory of Monte Gargano is peculiarly favoured in this respect. In the island of Sicily the plains of Catania to the south of Etna are infested with malaria. Besides the coast-line, the extensive flat plains of *Apulia*, the undulating *Campagna di Roma*, and the plains of Pæstum, are overrun with malaria; but worst of all are the Pontine Marshes and those near Viareggio, Mantua, to the north of Lake Como, in the neighbourhood of Venice, in the valley of the Po, and in the vicinity of Comacchio. Of the valleys thus infested, the principal are those of Cecina and Ombrone in Tuscany, and that of Diano in Calabria. The period of the year in which the evil effects produced by these marshes upon the health of human beings is most to be dreaded, is that extending from June to October, a time when all who have the means make their escape to one or other of the cool Italian summer resorts. It is unnecessary, therefore, here to enter upon the subject of intermittent fever.

No country in Europe, or perhaps in the world, enjoys the benefits derivable from a constant and plentiful supply of water so much as Italy. Not only is it almost completely surrounded by the sea, but it is, moreover, watered internally

[redacted] considerable magnitude, and by lakes of [redacted] great dimensions. In an agricultural point of view this circumstance is one of the utmost importance; but the [redacted] should remember that the heavy dews which [redacted] are a source of danger to himself. And [redacted] take the opportunity of mentioning that I know of [redacted] in which an invalid would be justified in [redacted] himself after sunset without the protection of [redacted] the absence of all earnest carefulness [redacted] the dangers arising from a cold and damp [redacted]. A Scotch mist is perhaps not too broad a [redacted]

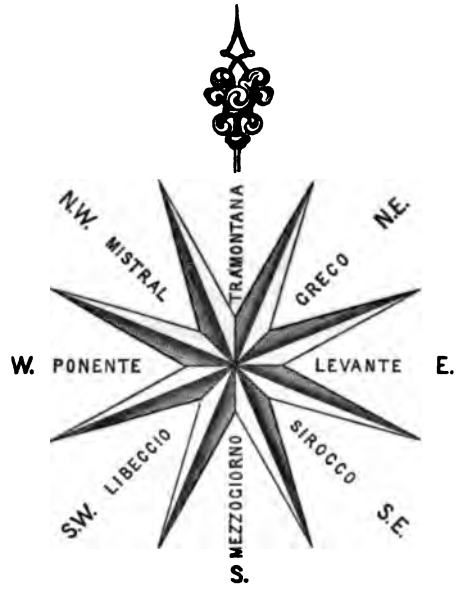
[redacted] the researches of M. de Gasparin, the [redacted] falls annually in the continental por- [redacted] a greater extent than that which falls [redacted] the same period; and it further- [redacted] examination of the figures afforded [redacted] that in both situations the [redacted] of the year are more fruitful of rain than any [redacted]. The following are the seasonal amounts collected [redacted] at the stations for different periods of time [redacted] —

	Winter	Spring	Summer	Autumn	Annual
[redacted]	[redacted]	[redacted]	[redacted]	13·708	39·844
[redacted]	[redacted]	[redacted]	[redacted]	11·377	31·756

[redacted] peculiar to the Italian atmo- [redacted] intensity as well as in uniformity with [redacted] [redacted] it loses it seems gradually, as the [redacted] recedes from the north, to assume a clearness and brightness unlike that of any other European country. The state of the atmosphere depends greatly upon the direction of the prevailing wind—the northerly wind, or *tramontana*, as it is usually called, being peculiarly that

inducive of clear and serene weather. In general terms, northerly winds reduce the temperature in all parts of Italy, whilst those from the south bring with them both warmth and moisture, and overcast the sky with dense clouds.

Perhaps a few words on the characters of the various winds of Italy may be offered with advantage to the reader in this place. The three southerly winds worthy of particular notice



are the *Sirocco* (south-east); the *Mezzogiorno* (south); and the *Libeccio* (south-west). The sirocco is a hot, oppressive wind, and is generally on its arrival at the southern shores of Italy, more or less loaded with moisture acquired during its progress across the Mediterranean. I have encountered this wind in the Sahara, and I have felt its influence at Naples; and my impression respecting its baneful effects is

[illegible] the water it is infinitely less [illegible] than on the southern side of [illegible] would be a hot [illegible] and crevice [illegible] causing an [illegible] there a wind [illegible] the [illegible] energy [illegible] at least. [illegible] it [illegible] the mental and [illegible] the strong man [illegible] refuse [illegible] this [illegible] long journey [illegible] while living in the sea- [illegible] a slight [illegible] in many places [illegible] especially at [illegible] I have witnessed [illegible] much of its [illegible] influence [illegible] th [illegible] the former. [illegible] the [illegible] I had [illegible] full [illegible] the [illegible] with. It is [illegible] with [illegible] yet ruinous [illegible] which [illegible] their

contents with stormy impetuosity upon the peninsula. In respect of violence, it is unlike those already mentioned, the *sirocco* being rarely very vehement, whilst the *mezzo-giorno* is usually soft and gentle. The direct west and east winds, named respectively *Ponente* and *Levante*, are not distinguished by any remarkable effects. They are usually the mildest of Italian winds, changing their characters with the seasons, whose severity they tend to alleviate. Of northerly winds, the three to be mentioned are the *Tramontana* (north), the *Mistral* (north-west), and the *Greco* (north-east). The *Tramontana*, or direct *north* wind, is essentially cold and dry, having, by its previous overland course, been deprived of any little moisture which its low temperature had permitted it to imbibe. It is peculiarly the wind of a clear, transparent sky, chasing away the clouds formed by winds of a warmer and moister class. In winter its temperature is decreased by its passage across the intervening snow-clad mountain heights ; even in summer it often gives rise to hail-showers, and not unfrequently, in conflict with other winds, to violent storms, accompanied by electric phenomena of a fearful nature. The *Mistral*, or *north-west* wind, the scourge of *Provence*, exercises its baneful influence over many parts of Italy. It is a cold, impetuous, withering wind, carrying along with it clouds of irritating dust, bearing down the elasticity of the healthy, and doubly oppressing the enfeebled energies of the sick. In the Peninsula, the effects of the dust with which it is elsewhere loaded is assuaged by its passage across the water, whereby, however, it attains hygrometric qualities which are more or less agreeable according to the season of the year. The *Greco*, or *north-east* wind, varies in its effects with the locality under consideration ; it is frequently vehement, usually less moist than dry, and bears the general distinctive char-

acteristics of northerly winds. In many parts of Italy there exists a regular alternation of northerly and southerly winds, the one class prevailing usually during the day, and the other through the night. The effect of this is to cause a marked range of temperature during the transition, against the effects of which invalids should be particularly careful to guard themselves.

The kingdom of Italy is traversed in the *isothermal* map by two of those lines whose direction is so shaped as to embrace all places having equal mean annual temperatures, whilst a third passes immediately to the south of it, touching the southern extremity of Sicily. The northernmost of these represents a mean annual temperature of 55°. From a somewhat high position in the Atlantic this line falls in a gradually oblique direction across the south of France, touches the coast of Liguria and falls into the Adriatic in about Lat. 43° N. To the south of this passes the line representing 59° of mean annual temperature. Rising gradually from the eastern shores of America, it falls in with Europe at the north of Spain, whence it sweeps in a gentle curve along the southern shores of the Bay of Biscay, through the range of the Pyrenees, across the southern confines of France, and then, sloping to the south, traverses the peninsula immediately to the north of Rome. The third and southernmost is that representing a mean annual temperature of 64°. It traverses the Bermudas in its passage across the Atlantic, passes immediately to the south of the Azores, crosses the south of Spain, runs along the Mediterranean until it touches the African coast near Tunis, and thence sweeps round the southern extremity of Sicily to rise still higher toward the east. The following arrangement, comparing the mean annual and seasonal temperature of six Italian cities with those of an equal number

of places in Great Britain, France, and Belgium, may be interesting to the reader; not that it denotes of itself any superior merits in the Italian climate beyond the indubitable fact of its possessing a generally higher temperature, but because it will serve to display at a glance a diversity of results arising from a variety of physical causes :—

Venice—Lat. 45° 26′ N.; Long. 12° 21′ E. Mean temperature of year, 55·44; winter, 38·06; spring, 54·76; summer, 73·06; autumn, 55·86.

Genoa—Lat. 44° 24′ N.; Long. 8° 54′ E. Mean temperature of year, 61·05; winter, 47·33; spring, 58·81; summer, 75·08; autumn, 62·97.

Florence—Lat. 43° 47′ N.; Long. 11° 15′ E. Mean temperature of year, 59·24; winter, 43·77; spring, 58·54; summer, 74·67; autumn, 59·96.

Rome—Lat. 41° 54′ N.; Long. 12° 25′ E. Mean temperature of year, 60·49; winter, 46·73; spring, 58·25; summer, 74·24; autumn, 62·75.

Naples—Lat. 40° 52′ N.; Long. 14° 15′ E. Mean temperature of year, 60·26; winter, 47·65; spring, 57·56; summer, 74·38; autumn, 61·46.

Palermo—Lat. 38° 7′ N.; Long. 13° 22′ E. Mean temperature of year, 63·08; winter, 52·50; spring, 59·05; summer, 74·41; autumn, 66·36.

Edinburgh—Lat. 55° 58′ N.; Long. 3° 11′ W. Mean temperature of year, 47·13; winter, 38·45; spring, 45·02; summer, 57·17; autumn, 47·89.

Dublin—Lat. 53° 21′ N.; Long. 6° 11′ W. Mean temperature of year, 50·09; winter, 40·67; spring, 48·55; summer, 61·07; autumn, 50·08.

London—Lat. 51° 30′ N.; Long. 0° 5′ W. Mean temperature of year, 50·83; winter, 39·50; spring, 49·06; summer, 62·93; autumn, 51·83.

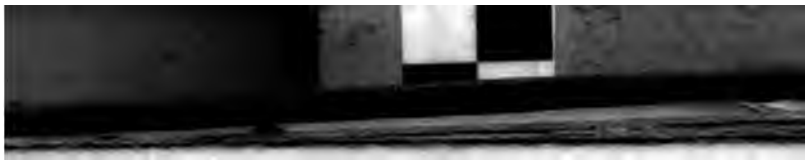
Penzance—Lat. 50° 7′ N.; Long. 5° 33′ W. Mean temperature of year, 51·78; winter, 44·23; spring, 49·31; summer, 60·91; autumn, 52·67.

Brussels—Lat. 50° 51′ N.; Long. 4° 22′ E. Mean temperature of year, 50·68; winter, 38·01; spring, 49·04; summer, 64·04; autumn, 51·60.

Paris—Lat. 48° 50′ N.; Long. 2° 20′ E. Mean temperature of year, 51·31; winter, 37·85; spring, 50·62; summer, 64·58; autumn, 52·20.

The number of days upon which snow falls in different districts of Italy increases in an irregular manner from south to north. Thus Palermo has two and a half snowy days per annum, Rome one and a half, Florence one and a third, Venice five and a half, and Milan ten. From twenty years' observations it has been remarked, that in Palermo snow may fall any time between December and April. At Florence it has occurred so early as the month of October, and in Rome so late as that of April. Snow rarely remains in the towns of southern Italy, although the neighbouring mountains are frequently covered; but in the severe winter of 1812 the water of the lake of *Villa Borghese* at Rome was frozen for several days to such a degree as to afford opportunity for skating.

As a winter resort for invalids, the climate of Italy has its champions and its antagonists, whose party zeal has frequently urged them, as it seems to me, beyond the limits of valour as well as those of discretion. From the one side we hear the exultant joy of one who is vain enough to suppose he has lighted upon an *El Dorado*, whilst from the other proceed the bitter vituperations of one who had been foolish enough to expect it. The admirer of Italian climate relates a tale of breezes balmy as those of "Araby the blest," redolent of orange blossom and jessamine, of highways girt



with vines, and of shady walks through orange groves, the description of which he adorns with language peculiar to the classic realms whose cause he advocates. His opponent is less voluble; he is satisfied only with the utterance of undisguised censure; he avoids expletives, but hurls at his antagonist with hissing violence the words *mistral, sirocco, discomforts.* Undoubtedly both are right to a certain extent. Truth lies between them. To the invalid who requires change of scenery, rest from habitual toil, and a certain amount of mental excitement, the special result of travelling from place to place, no country can afford the necessary remedial agents more bountifully than Italy. But the consumptive patient, and all others the course of whose malady may be restrained only by a residence in, and not simply by passing through, a foreign country, should bear in mind that change of climate is not a specific remedy, but merely a mean to an end. He seeks a foreign climate only because in his native land he cannot, even with the utmost carefulness, derive that benefit from *out-door exercise,* which is essential to his well-being. And in Italy even, let him still remember, it is only by pursuing the same rigid carefulness that he can or ought reasonably to hope for that inestimable advantage which was denied him at home. There are minor circumstances to be attended to in individual cases; but the cardinal points to be desiderated are simply such as conduce to the safety of taking a necessary amount of exercise in the open air. Let not an invalid who dare not at home depart in the least degree from a strict observance of hygienic laws suppose that in Italy he may disregard them. Let him not suppose that in Italy he may walk abroad morning, noon, and night; that he may indulge in evening visiting; that he may do without fires, sit at an open casement, put off all

and evenings: he m
noxious winds: he
from *them*. Let him
his apartments ought
events by no means a
warm by means of fir
on dull days, and whe
means of a proper ventil
constantly in the shade,
that he may consult it
necessary to wear out of
he is walking in full expo
the months of spring, that
perly that of the atmosphe
direct solar beams, and tha
undergoes a change of temp
stout over-coat; let him gua
unbrella from the powerful r
his case have

I ought to add, however, that the above remarks apply to Italy rather as she existed before the recent annexation of a portion of her territory to France, whereby she has been deprived of some of her choicest invalid resorts, including Mentone.

WINTER RESORTS.

BAIÆ—one of the principal ports as well as one of the most fashionable watering-places of the ancient Romans, is situated on the bay of the same name, at a distance of ten miles to the west of the city of Naples. The climate of Baiæ is less severe, and subject to fewer meteorological vicissitudes, than that of Naples, and has on this account been recommended as a winter resort to invalids suffering from incipient phthisis, or other chest affections, to whom an atmosphere as slightly irritating as possible may be essential. But when it is understood that to its usual mildness is added an undue amount of humidity, whilst at the same time much of the surrounding neighbourhood is occupied by marshy grounds, its sanative influence may be questioned; at all events, Baiæ is not a locality calculated to attract invalids from a distance; and those who, being in the vicinity, wish to experiment upon the influence of its climate, should do so with extreme caution.

FLORENCE.—Many circumstances combine to render Florence a pleasant residence to such as are led to Italy by any other pretext than lack of health. There is scarcely any Italian city whose resources of entertainment, whether in art or literature, are more available to the foreigner; whilst, at the same time the natural attractions presented by the surrounding country are of no mean order. The city is situated in the rich and fertile *Valdarno*. Its geographical

position is in Lat. 43° 46′ 11″ N.; and Long. 11° 15′ 55″ E., at an elevation of 140 feet above the level of the sea. It is almost surrounded by the Apennines, which present a variety of aspects corresponding with their different heights, here displaying the vegetation of a southern climate, there the bleak and rugged features of the north. The river Arno, which flows through one of the richest valleys in Italy, passes through the town in a direction from the south-east to north-west, dividing it into two unequal parts, of which the northern is much the larger.

The topography of Florence at once clearly indicates the peculiarities of its climate. The proximity of the lofty Apennines, which are covered with snow during many months, reduces the winter temperature, and imparts to the spring months a variableness which is very injurious to persons of delicate constitution; whereas in summer, the heat is rendered intolerable by the want of a free access of cool breezes. In winter and spring the surrounding mountains pour down piercing currents of air. The *tramontana*, or north wind, is the bane of these seasons; it is a cold, penetrating blast, and is very severe during January and February. The east wind, which blows frequently in spring, has a withering influence both on animate and inanimate nature. The subsequent months of April and May have the benefit of the sun's revivifying rays, but they are on this account more treacherous; the shady sides of the streets are still bitterly cold, and a sudden transition from sunshine to shade should at this season be particularly avoided. During June, July, and August, Florence is scarcely habitable, and all who possess the means seek relief from its insufferable heat by a residence on the neighbouring hills, or elsewhere. After this time, until nearly the end of the year, the climate is very agree-

able. The mean annual temperature of Florence is 59·24, that of the seasons and months being as follows:—Winter, 43·77; spring, 58·54; summer, 74·67; autumn, 59·96. January, 41·20; February, 44·58; March, 50·56; April, 59·65; May, 65·41; June, 71·17; July, 76·93; August, 75·92; September, 69·15; October, 60·40; November, 50·34; and December, 45·52. There is a plentiful fall of rain, averaging about 32 inches annually, most of which falls during the latter weeks of autumn and early weeks of winter, when for several months the atmosphere is charged with moisture, often giving rise to fogs. The rain does not remain long on the ground; the drainage being good, it rapidly finds its way into the Arno. The mean annual number of rainy days may be stated at 109. As a residence for invalids, Florence is available to a somewhat limited class. It is not subject to epidemics of any kind, unless it be that of the miliary fever, which, however, does not readily attack strangers. But inflammatory diseases of the chest are very fatal, and consumption is as well known here as in any part of the world. Therefore all persons labouring under pulmonary affections, or complaints of any kind in which the respiratory organs exhibit inflammatory symptoms, should avoid Florence. On the other hand, some cases of asthma, gout, scrofula, &c., have been benefited by a residence here; and, like all climates of a bracing character, it may be resorted to by such as are of lethargic habits, and whose nervous system is below par.

Genoa.—From the peculiar position which this city occupies, having lofty mountains in the rear and the open sea in front, it might be supposed to enjoy an immunity from certain atmospherical phenomena such as unfit many other Italian cities for a winter residence to invalids. But it is in reality quite the opposite. Every wind that can afflict

the lungs, catarrhs, and consumption, are well understood. Scrofula prevails to a considerable extent, and rheumatism is by no means uncommon. An epidemic of cholera first visited Genoa in 1834–35, and was again violent and destructive in 1854. The sanitary arrangements of the town have of late years been much improved, and are now in a tolerably satisfactory condition. The locality near the harbour is the worst. Consumptive invalids should never remain at Genoa, and if it be necessary to make it a resting-place, the stay should be as brief as possible; the opening days of summer are the safest for this class of invalids. As a winter resort, Genoa has little or nothing to recommend it; a few days' residence is sufficient to exhaust its natural as well as its artificial attractions, and those who are strong enough to bear its fitful climate will scarcely deem it necessary to travel so far in search of one. Where change of scenery, without a necessity for an equable climate, is a desideratum, Genoa may take its place with others. It has, however, been favourably mentioned as a suitable residence in certain forms of dyspepsia, and in some cases of threatening paralysis. Gout, likewise, is said to be benefited by it, as well as hypochondriasis.

MILAN—occupies a position between the rivers Olona and Saveso, in the midst of the wide and fertile plain of Lombardy. Its geographical position is Lat. 45° 28′ 1″ N., Long. 9° 11′ 20″ E.; and it rests at an elevation of 394 feet above the level of the Adriatic. It presents no sanative attractions to the invalid; but in as much as it lies in the way of travellers to and from the southern parts of Italy, it is much frequented by them. The magnificent Gothic Cathedral, with its 4500 statues, is of itself a sufficient attraction to the city; but having seen this and

winter residence, or to go in search of a summer resting-

By reason of its unsheltered all winds more or less, and vicissitudes of temperature. the city from the direction of from the northernmost to th from the south, after cross slightly impeded in their app and moist winds, and are opp the north and west, the latter passage across the barrier of direction. The cold winds hav and consequently the climate comparatively low mean annua of the continental rather than mean temperature of the season 36·07; of spring, 54·88; of sum 55·90; that for the whole year between the temperature of the is 41·40; and the difference be and win

appearance of the Milanese. Observations made during a series of sixty-eight years have determined the mean annual number of rainy days as 62, the maximum having been 81. Rain falls nearly equally in all seasons, with a trifling preponderance, perhaps, during that of autumn. Snow falls usually on 10 to 15 days in the year, the maximum having been (between the years 1820 and 1830) 21 days. The climate of Milan is in no way that I am aware of commendable as a health resort. It is the hotbed of a loathsome disease—*pellagra*, or *Italian leprosy*,—for the reception of whose wretched victims it contains a magnificent and well-constructed hospital.

NAPLES.—There are few places so apt to win the desire of the traveller to explore their silent tombs, and to read in mouldering stones the history of their past grandeur, as Naples; and if he be in health, no place will better repay a minute investigation of its relics, and no place will afford him more exquisite natural scenery. But to the invalid—especially if he have any tendency to consumption—few places can be more pernicious; for the very charm of its position is the bane of its climate.

The city lies upon the northern shore of the Bay of Naples, resting at the foot and upon the slopes of a semi-circular range of hills of volcanic formation. It is divided into two unequal parts by a transverse spur, which leaves the barrier hills behind at Capo di Monte, and, passing southwards, projects into the sea, where it terminates in the headland of Pizzofalcone. The eastern division comprises the old town, and is much the larger of the two, that on the west consisting chiefly of the Riviera di Chiaia, a long and beautiful promenade, in which are situated the principal hotels, having the hill of Vomero behind, and the sea, with the Villa Reale intervening, in front. Fort St

Elmo rests upon the back of the spur overlooking the whole town and neighbourhood; and between this and Pizzofalcone is a depression occupied by streets which connect the east and west parts of Naples. The length of the town, from Mergellino in the west to the river Sebeto in the east, is four miles, and it is two and a half miles deep from Capo di Monte to the Castel dell' Ovo. Its geographical position is Lat. 40° 51′ 8″ N.; and Long. 14° 15′ 5″ E. It has a mean annual temperature of 60·26; that for the seasons and months being as follows:—Winter, 47·65; spring, 57·56; summer, 74·38; autumn, 61·46. January, 46·24; February, 47·59; March, 51·15; April, 56·68; May, 64·85; June, 70·77; July, 76·10; August, 76·26; September, 69·35; October, 61·93; November, 53·11; and December, 49·12.

Notwithstanding the advantage of a southern latitude, and an atmosphere whose serenity has been the theme of so many poets, Naples has grievous disadvantages to contend with when challenged as a resort for invalids. The position which it occupies in the Bay leaves it fully exposed to the south-west and west winds; whilst unfortunately the hills behind leave channels enough for a tolerably free access of winds from the north. The hill of Posilipo is indeed an effectual obstacle to the due north, but it is insufficient to protect the town from the north-west; which wind, having once passed this point, blows without restraint through the entire western division. The Somma preserves the town from the direct east wind, but that from the north-east gains access between Capo di Chino and Capo di Monte; and lastly, the south and south-east winds fall upon the town after crossing the mountains of Castellamare and Sorrento.

From the experience of Renzi, as classified by M. Carrière,

it appears that the relative frequency of the various winds is as follows: the south-west being estimated at 5, the south bears a proportion as 3; the north, $2\frac{1}{2}$; the north-west, $2\frac{1}{4}$; the west, 2; the north-east, $1\frac{3}{4}$; the south-east, $1\frac{1}{3}$; the east, 1.

The southerly winds, which predominate over the northerly in the proportion of 9 to 6, are loaded with moisture, and (especially the south-east or sirocco) exercise an enervating influence upon the intellectual as well as the physical capacities. The mistral (north-west) is a cold moist wind, having all the characteristics of a northern climate; it is indeed so severe as to have gained for that portion of the town which it affects (including the district generally occupied by strangers) the epithet of "Siberia." The greatest quantity of rain falls during the months of October and November, at a season when the south and north winds come into antagonism. The mean annual amount has been variously estimated: Gasparin states it to be 31·356 inches, Cevasco 37·050, and Renzi, upon twenty years' observation, represents it as 29·250 inches. Snow is seldom seen in Naples, and when it does fall it melts immediately; but on the surrounding hills it often lies for several weeks, and renders the winds which travel across it bitterly cold.

In general terms, the climate of Naples may be pronounced to be tolerably good and enjoyable for those in health, but treacherous to invalids. In spring the winds are variable and insidious, having their dangerous effects disguised by the warmth of a brilliant sun; the heat of summer is alleviated by the cool sea-breezes; autumn is rendered disagreeable by the sirocco, and by the effluvia from the marshes which lie to the east of the town. Among the diseases which manifest themselves here are catarrh

[redacted]

[redacted] work on Ozone [redacted] has [redacted] the difficulties of the temperature [redacted] were to arrive at Naples by [redacted] in the month of November [redacted] to form a very erroneous [redacted] according to the point from which the [redacted] from the south, he would be inclined [redacted] the difference between Naples [redacted] from the north-east, he [redacted] he had not sailed in a wrong [redacted] Cumæ instead of the Gulf [redacted] west zephyr skimmed the [redacted] waved the shores of Baiæ, he [redacted] that he had got into the gardens

of the Hesperides, or the isles of Atlantis, so green is the vegetation, so balmy the air, so mellow the sunbeams, and so azure the skies."

PISA—is situated in a fertile but marshy plain of Tuscany. Its geographical position is Lat. 43° 43′ 11″ N., Lon. 10° 23′ 58″ E., and it is traversed from east to west by the river Arno. This now much neglected and comparatively empty city was once one of the most celebrated of Italian towns, and for a long period was the resort of invalids, especially of the consumptive class, who flocked to it in great numbers, not only from foreign countries but also from different parts of Italy, in the full and buoyant hope of a speedy release from their distressing sufferings. That relief was yielded to them but too often by the cold hand of death. Probably Pisa attained its reputation rather from being of comparatively easy access, than from any certain knowledge of its sanative influence. Certainly it was not based upon the science of meteorology; for even in the present day, I am not aware of any complete series of observations having been made. It is a dull, inanimate town, and though still occasionally visited by consumptive strangers, no longer holds its former rank amongst Italian health resorts. As in other days, valetudinarians still occupy that part of the town known by the name of the *Lung' Arno*, a locality formed by a *bight* in the river, stretching towards the north, and giving a warm southern aspect to the crescentic dwellings on its northern bank.

Pisa is protected from winds only on the north and east; elsewhere it is fully exposed to anemological influences, which are usually of a soft, moist, and relaxing character. The north-east winds search through the valleys of the Arno, whilst those from the east are somewhat interrupted

in their course by the lower range of Tuscan hills. From the opposite direction the west and south-west winds arrive laden with moisture from the Mediterranean, whilst the flat and marshy country around Leghorn impresses the winds from the south and south-east with characteristic dampness. Hence the climate of Pisa is mild, damp, and relaxing, and has a tendency to depress the vital energies; and, as such, must be baneful in its effects upon consumptive patients, at least upon such as have passed the very outset of the malady. Its sedative influence in allaying irritation of the lining membrane of the pulmonary system, and in depressing vascular excitation, can be productive of little benefit when beset with so many elements of antagonism to a healthy physiological action. In the treatment of other diseases, there is nothing peculiar in the climate of Pisa to obtain for it a preference over that of other localities, in which, whilst the body is undergoing repair, the mind may be refreshed by a pabulum of a much higher order. According to Sir James Clark, the mean annual temperature of Pisa is 59·45, that of winter being 44·83, of spring, 57·81; of summer, 73·76; and of autumn, 61·45. For the year and seasons taken in the same order, Schouw gives the following figures:—60·41, 46·09, 58·62, 73·80, and 63·15.

Rain occurs very frequently at Pisa, and almost at all times the atmosphere betokens the presence of moisture. According to Piazzini, the annual fall of rain amounts to so much as 45·66 inches; whilst Schouw gives as the seasonal amount, for winter, 9·945 inches; for spring, 8·831; for summer, 6·825; and for autumn, 18·525.

The mineral waters of Pisa are abundant, and are employed in the form of baths at the base of Mount St Julian. They contain, in greater or less quantities, the salts of soda, magnesia, lime, and iron, but have comparatively little of

the sulphurous character which obtains amongst the mineral springs of Southern Italy.

Chronic bronchial affections, gastric fever, and dysentery, are amongst the most common of the diseases manifested in Pisa. Ophthalmic affections, and others exhibiting the results of a damp and vitiated atmosphere in diminishing the vital powers, are to be constantly met with. Congestion of the abdominal viscera is very common amongst the inhabitants of Pisa and its environs, for which they make internal use of certain of their mineral waters; but, as is the case with all springs of this kind, travellers should be wary of commencing a course of self-treatment by means of them, without a cautious preliminary training and the advice of a competent medical practitioner.

Pozzuoli—A suburb of Naples, though in ancient times a thriving city, is now a place of little importance; nor is its sanative influence calculated in any degree to restore its reputation. Renzi, an Italian authority, and M. Carrière so well known in connection with the climate of Italy, both regard the climate of Pozzuoli as favourable to a modification, if not to an entire dissipation, of phthisical symptoms. The climate is certainly much milder than that of Naples, but it has never met with acceptance at the hands of English physicians, who, whilst approving the judicious employment of change of climate as a remedial agent, justly deprecate a reckless abuse of it. Renzi supposes that the vapours of sulphur which are transfused through the warm atmosphere of Pozzuoli, exercise a soothing and beneficial effect in complaints of the mucous membrane lining the air-passages. There are three mineral springs in the vicinity, one of them yielding water at a temperature of 106°, the others cold. The former, called *Acqua dell' Antro*, is emitted in a clear transparent stream,

and is much frequented by persons afflicted with gout, visceral congestions, and certain kinds of dyspepsia; as well as by others suffering from rheumatism, cutaneous diseases, and scrofula. In the former class of cases the waters are administered internally, whilst in the latter they are employed in the form of baths. They contain the carbonates of soda, magnesia, lime, and iron; the sulphates of soda and lime, and the chlorides of sodium, magnesium, calcium, and aluminum. The temperature of the spring varies a little according to the season. The *Acqua de' Liposi* and the *Acqua Medea* are cold springs, containing nearly the same ingredients as the hot spring, with the addition of free carbonic acid gas. The Acqua de' Liposi is sometimes employed in ophthalmic affections; but otherwise the cold springs are seldom used medicinally.

RIVIERA.—The *Riviera di Genova* is a name applied to those parts of the Mediterranean coast which lie to the east and west of Genoa, the former being known as the *Riviera di Levante* and the latter as the *Riviera di Ponente*. Leaving Nice by the stupendous Cornice road, the traveller commences his journey by ascending the Turbith, a mountain not less than 3000 feet high. During the ascent, the highest point of which does not exceed 2100 feet, the view obtained over the bays of Villefranche, St Jean, Beaulieu, and Esa, is one of the most gratifying I ever experienced. Passing through Turbia, at an elevation of 1900 feet, the road makes a continuous descent, bringing into view the towns of Monaco and Mentone, and a wide expanse of ocean flanked by the most enchanting scenery.

Monaco is prettily situated on a small bay commanded by batteries, whilst the town itself is further protected by fortifications. Along with the entire principality, it has fallen into the hands of the French. Passing by the mule-

path leading down to Monaco, the road continues to descend for eight miles further (leaving Roccabruna on the left), through groves of oranges, of olives, and, finally, through a vista of elegant plane trees to Mentone—(See MENTONE).

The Cornice road next leads to *Ventimiglia*, formerly a much coveted military station, and thence to *Bordighera*, where the date palm is cultivated, giving a somewhat tropical aspect to the locality. The fruit of this plant, however, is not so much the object of growth as the leaves, which perform in the ceremonials conducted in the church on Palm Sunday. At *St Remo*, the next town of importance along the *Riviera*, palms, lemons, and orange trees grow in great profusion, the fruit of the former almost attaining maturity at this spot. *Oneglia*, the picturesque valley of *Albenga*, *Savona*, *Albisola*, *Voltri*, *Pegli*, *Sestri di Ponente*, and many other prettily situated villages, intervene between St Remo and Genoa. All these localities are marked by a mild and genial climate, and from the romantic scenery with which they are associated are rendered peculiarly attractive. Unfortunately, the want of *home comforts* in many of them is a great impediment in the way of their selection as places of winter resort.

The *Riviera di Levante* is simply a continuation of the former road, being however, at the same time, the main line of communication between Tuscany and the cities of Turin and Milan. The same ever-changing ever-beautiful scenery passes in review before the traveller as he leaves Genoa on the west, and sets forward in the direction of the State of Tuscany. Several villages and towns on this division of the Riviera occupy positions of considerable importance in a medical point of view. Many of them are becoming better known through the daring of adventurous invalids, who, having made bold to depart from the track of

ordinary health-seekers, have met with a commensurate reward in one or other of the sequestered spots dotted here and there along the route from Genoa to Pisa.

Nervi is celebrated for its gaily decorated houses and prolific gardens, in addition to its maritime position. *Chiavari* adds to the usual luxuriant vegetation of the Riviera the aloe, thereby assuming a somewhat Eastern aspect. *Sestri di Levante* contains, amongst other conveniences, a good beach and bathing-machines. And finally, *La Spezia*, situated on the noble and capacious gulf of the same name, demands at least a passing notice. It is a town of 10,000 inhabitants, having tolerably good accommodation, and is much frequented as a watering-place, for which it enjoys singular facilities. The bay or gulf of Spezia, an inlet of the Gulf of Genoa, is seven miles in length and of a breadth varying from two to six miles. The scenery around the gulf and in the *banlieues* of Spezia, is of the most fascinating description. The bathing is good, and is much employed during the fashionable season. The road, after leaving Spezia, passes over the neighbouring upland, and then descends into the valley of the *Magra*, which river the traveller either fords or ferries about one mile short of *Sarzana*. This latter place is the capital of the province of Levante; it lies eight miles to the east of Spezia, between the river *Magra* and the Modenese frontier.

ROME.—The geographical position of this city, taken at the observatory of the Collegio Romano, is N. Lat. 41° 53′ 52″; E. Long. 12° 28′ 40″. It is situated on marshy ground at the base of a series of low hills, and in the midst of the vast and undulating plain known as the *Campagna di Roma;* distant from the sea about fourteen miles, and has a mean elevation of twenty feet. The lower parts of the city, in the neighbourhood of the Tiber, which in its course divides

Rome into two unequal parts, are frequently inundated after heavy rains. The seven hills are neither so lofty nor so distinct as formerly ; they owe their origin to submarine volcanic action, by which they were forced through the substratum of tertiary marine deposit upon which chiefly the city is built.

Rome has a mean annual temperature of 60·49 ; that of the seasons and months being as follows :—Winter, 46·75 ; spring, 58·25 ; summer, 74·24 ; autumn, 62·75. January, 45·03 ; February, 47·35 ; March, 51·67 ; April, 57·81 ; May, 65·26 ; June, 71·11 ; July, 75·97 ; August, 75·65 ; September, 70·07 ; October, 64·81 ; November, 53·38 ; and December, 47·80. It is subject to remarkably sudden and extreme changes of temperature, by reason of its diametrical exposure to the prevailing winds ; for it is equally open to the north-east and south-west, whence come respectively the cold shrivelling winds from the mountains, and the warm moist winds which reach it across the Albano and that portion of the Campagna which stretches towards the sea. This circumstance, together with the wretched influence of the surrounding marshes, suggests a cautious recommendation of this locality as a winter residence for consumptive invalids ; nevertheless, its climate enjoys a reputation which, although modified by comparatively recent investigations, is still upheld by many eminent physicians. Observers are by no means unanimous in their statements as to the relative frequency of the different winds which influence the climate of Rome ; but, generally speaking, it may be asserted that the southerly winds predominate, giving to the climate its soft and relaxing character. The northerly winds usually prevail in the mornings and evenings, and the southerly winds during the day and partially through the night. The west wind here

partakes of the character of a refreshing sea-breeze, whilst the north-west, or mistral, has scarcely any influence. The sudden alternations of temperature following the changes between the northerly and southerly winds should be carefully guarded against by persons of delicate constitution. The *tramontana*, which occurs particularly in winter and spring, is a cold, searching, biting, shrivelling wind, the bane of Rome, as the mistral is of Naples and the east wind of our own country. The *sirocco* from the south-east is generally a dry wind, but occasionally loaded with moisture; its action varies according to the constitution of the person affected by it; usually it is characterised as an enervating and depressing wind, inducing an entire prostration both of mental and physical capacities, and such as are of what is termed *a full habit of body* are much distressed by it; others, again, who shrink from the north wind (*tramontana*) find no inconvenience in the sirocco.

Whatever term it may be expedient to apply to the climate of Rome in respect of its hygrometrical condition, it must be admitted that the peculiarity of its topography, together with the prevalence of southerly winds, gives it a decidedly moist character. Schouw states the mean annual fall of rain to be about thirty inches; and the number of rainy days 114. Over a series of thirty-nine years, the minimum of rainy days, which occurred in 1828, was 56, and the maximum, in the year 1784, was 158. Snow is of rare occurrence in Rome, the average number of days in which it falls during the year being only 1½. Frosts are generally of short duration, but an exception to this occurred in the severe winter of 1812, when there was ice available for skating during several days.

October is considered the pleasantest month in Rome, following the soft September rains; the early weeks of

November bear much the same character; but after this the winter rains set in with cold northerly winds, and the sky wears a dull and lowering aspect. The rains pass away with the old year, and the opening months of the new one vary in character, but are generally tinctured with northerly winds. As soon as the sun begins to feel warm, it is time for invalids to be more instead of less cautious. Every writer on the climate of Rome, and every guide-book, tells of the danger of passing suddenly from the sunshine into the shade. I have experienced in Rome the effects of these noxious transitions, and I contribute my mite of warning. Let no person hurry to a church (unless St Peter's, whose temperature is uniform throughout the year), to a ruin, to a picture gallery, nor, above all, to the Vatican; and let no person visit any of these without an additional garment to wrap about him whilst he is examining their contents. Irreparable injury may be inflicted upon even a robust individual by incautiously entering one of these cold halls whilst the body is warm from previous exertion. Towards the end of May the climate becomes unhealthy, and June, July, and August are the fever months. During winter, the localities in which the principal hotels are found are all healthy enough. The object of the visitor in choosing his residence should be to get as much as he can of air and light, with as little as possible of dull, shady courts and moisture; the higher up stairs the better.

The general tendency of the Roman climate upon the inhabitants appears to be to induce a morbid, nervous sensibility, with a full, plethoric habit of body, accompanied by frequent headaches, and a torpid state of the alimentary system. Its particular evils are, in winter and spring the prevalence of inflammatory diseases of the chest, and in summer malarial fever. Hence, it is clear that all cases of

the nature of apoplexy, perverted nervous sensibility, certain forms of dyspepsia, torpidity of the liver or bowels, hypochondriasis,—in short, all such cases as indicate the propriety of seeking a bracing climate,—should avoid Rome. On the other hand, this climate has the credit of relieving some forms of bronchial complaints, especially where, in a chronic state, they are complicated with much irritability of the lining membrane. In chronic rheumatism also, when judiciously employed, Rome has proved a profitable residence. Then, lastly, as to its curative influence in consumption, opinions are diverse. It has never been recommended except in the very beginning of the disease; and even then, after carefully weighing the opinions which have been expressed on both sides, aided by my own personal observations of the climate, I am disposed to think that the evidence in favour of Rome, as a winter residence for this class of invalids, is not sufficient to warrant the physician in putting his patient to the expense and inconvenience of so long a journey. I am satisfied that the imminent peril to which all visitors invariably expose themselves in Rome (I refer to the churches, picture-galleries, ruins, &c.) more than counterbalances its supposed superiority over some of our own southern climates. And as to domestic felicities, I have always been impressed with the thoroughly practical remarks made many years ago by a consumptive invalid (Mr Matthews), who wrote from Rome, and said of it, when comparing it with Devonshire—"If the thermometer be not so low here, the temperature is more variable, and the winds are more cutting. In Devonshire, too, all the comforts of the country are directed against cold; here all the precautions are the other way. The streets are built to exclude as much as possible the rays of the sun, and are now as damp and cold as rain or frost can make

them, And then, what a difference between the warm carpet, the snug elbowed chair, and the blazing coal fire of an English winter evening, and the stone staircases, marble floors, and starving casements of an Italian house, where everything is designed to guard against the heat of summer, which occupies as large a portion of the Italian year as the winter season does of our own."

SALERNO—is situated on the northern shore of the gulf of the same name, and at a distance of 30 miles E.S.E. from Naples. The Marina, which is about one mile in length, is the only part of the town available for strangers, the older parts of it consisting of narrow streets, in which sanitary laws are despised. Salerno has not in modern times enjoyed that amount of valetudinarian patronage which some late writers deem it worthy of. From its topographical peculiarities, it might be supposed that the temperature of Salerno, protected as it appears to be on all sides except that open to the sea, would be considerably higher than that of neighbouring places; but, according to Barzelotti, it is much the same as that of Naples; whilst, from the observations of Renzi, we are given to understand that the temperature does not rise so high as that of Naples by between three and four degrees, and that, on the other hand, it sinks to about the same extent below it. The town is said to be free from the noxious vapours which emanate from the neighbouring plain of Pæstum. The air is reputed dry and cool, in consequence of the predominance of northerly winds, and also on account of the barrier opposed by the upper extremity of the gulf to the approach of the warm and moist west winds, as well as those, so deleterious in many parts of Italy, from the north-west.

The climate of Salerno is somewhat tonic in its effects; it is not suitable for consumptive patients, but is supposed

to be advantageous in the amelioration of chronic catarrh, debilitated lymphatic constitutions, certain forms of dyspepsia, and general asthenia.

VENICE.—The topographical peculiarities of Venice account for the predominant characteristics of its climate; but they do not, at first sight, convey to the mind of the casual observer a correct appreciation of their sanitary influence. Thus, it might rationally be inferred, from the marshy aspect which surrounds the city, that intermittent fever would be the prominent disease of the place, whereas it is, in truth, the resort of such as have elsewhere imbibed the pernicious germs of this disorder. Venice lies in N. Lat. 45° 25′ 9″, and E. Lon. 12° 20′ 2″. It is constructed upon piles, in the midst of a vast shallow lake or lagoon, at a distance of two miles from the mainland of the Continent, with which it holds intercourse by means of a magnificent bridge of 222 arches, sustaining a portion of the railway to Padua. The lagoon in which the city is situated is formed of the alluvial deposits from the rivers which descend to empty themselves into the head of the inland sea. This shallow lake is oval in form, and stretches in a direction from N.E. to S.W., being separated from the Adriatic by a long strip of low-lying land, through intervals in which the waters of the Gulf of Venice are permitted to ebb and flow daily. Elsewhere it is bounded by the mainland. The city itself is based upon a number of small islands, and is everywhere intersected by canals of various capacities, which constitute its highways. By reason of its proximity to lofty mountains, Venice is peculiarly circumstanced with respect to its prevailing winds. To the northeast of it are the Julian and Carnic Alps; but they do not afford sufficient shelter against the bleak and piercing wind which arrives from that direction. This (N.E.) is the pre-

vailing wind; it is cold and dry. It has the effect of sweeping away the vapours emanating from the lagoon, and gives rise to a serene and transparent atmosphere. When, however, it supervenes upon a warm moist wind, a shower of rain usually intervenes before the appearance of the clear sky. In winter, a fall of snow is occasionally the result of such changes, whilst in summer they frequently give rise to very violent storms. The only drawback to this otherwise salubrious wind exists in the vicissitudes of temperature which it occasions, though these are neither so intense nor so sudden as in many other parts of Italy. The Alps directly to the north of Venice are loftier, and oppose a much more effectual barrier to the boreal winds, which would otherwise sweep vehemently over the city. A range of Lombardian mountains breaks the force of the west and south-west winds, whilst a transverse spur of the Apennines offers also a feeble resistance to those from the south and south-south-west. But the direct east wind, as well as that from the south-east (sirocco), has a free course over the lagoon. So that whilst the due north and west winds are impeded in their approach, and are consequently the least frequent of the winds of Venice, those from the east, north-east, and south-east may be called the determining winds of the climate. The mean annual temperature of Venice is said, from seven years of observation, to be 55·83; that of winter being 38°, of spring 54·75, of summer 73·08, and of autumn 55·83. Observations made during the same number of years give, as the mean annual number of days in which snow fell, 5½, and as the mean annual number of rainy days, 75. The hygrometric condition of the atmosphere is not what might be expected as a result of the surrounding marshes, the annual amount of rain being not more than 36·387 inches, and the hygrometer does not afford nearly so high indica-

tions of temperature as in many of the maritime places of Southern Italy. The climate of Venice is not highly estimated by physicians generally, and it is comparatively rarely resorted to by others than sight-seeing travellers, or by invalids for a short while only. Many circumstances combine to render the climate mild, soft, and equable. From chemical experiments made upon the atmosphere by Calvert and Pisanello in 1847, it was ascertained to be largely impregnated with *bromine* and *iodine*, and it was supposed that this circumstance would be sufficient to procure for it a reputation in the cure of scrofula and consumption; but it can scarcely be considered eligible on this account merely. The inhabitants of Venice are disposed to the nervous type of temperament; they are usually of depressed mien, and are subject to a large class of nervous disorders. The climate is decidedly sedative in its tendency, and should therefore be avoided by all persons of reduced strength, and especially those advanced in phthisis. In the very earliest stages of consumption, and in some chronic inflammatory bronchial affections, as also in cases of full plethoric habit of body, which require simply their hypersanguineous tendency averted, Venice may be occasionally recommended.

Its peculiar construction, its works of art, as well as its historical associations, are several circumstances which invest Venice with charms peculiarly attractive to the invalid traveller. But the one thing unique about it is the manner of locomotion. The soft, easy, gliding motion of the gondola is most grateful to the feelings of the valetudinarian; and, if other things were equal, this circumstance would place Venice at the very summit of places of winter resort for consumptive persons, to whom the fatigue of walking and the jolting of a carriage are alike unbearable.

SUMMER RESIDENCES.

Besides the places, already mentioned, that are frequented during the colder seasons of the year, there are in Italy many others which are resorted to during the hot months. Some of these possess mineral springs, others afford commodious sea-bathing, and for these reasons are visited by the inhabitants of their vicinity much in the same manner as our own summer watering-places are resorted to by valetudinarians at the same season. Invalids who have spent a winter in Italy, and who may be desirous of passing another cold season in the same country without the fatigue or expense of a long journey to England during the interval, will find in one or other of the places to be mentioned presently, a cool retreat from the ardent heat and unhealthy atmosphere of the larger Italian towns; whilst, at the same time, the fascinating description of the scenery which generally surrounds such localities will afford an abundance of mental recreation.

ABANO—a town of Lombardy, six miles south-west from Padua, possesses mineral springs whose waters enjoyed a high reputation under the ancient Romans. They yield so profuse a quantity of water that it is employed not for medicinal purposes only but for many ends, of which that of working a mill is one. The waters are limpid to a degree; they have a slightly naphthous odour, and a somewhat saline and bituminous taste. They rise at a temperature of not less than 181·40; and even lower down, where they are collected in the form of a mill-dam, their temperature is as high as 176·00. They are strongly impregnated with mineralising ingredients, amounting to 101·736 grains per quart. Of these the chloride of sodium is the most abundant; and after it the carbonate of lime, sulphate of lime, and salts of

necessary to stimulate
at the same time where
organs to the periphery is

ACQUI—a walled town of
of the *Bormida*, at a dist
south-west from Alessandri
saline mineral springs, whose
sulphurous odour, and of a s
taste. The springs which aris
have a temperature of 167·00,
purposes. The medicinal wate
from the town, and do not ex
The waters themselves are rare
gents after the application of t
from the deposit that has been
Acqui the mud is applied to th
in the same way as bricklayers
hands are employed in the o
The mud quickly dries, and son
sensation, owing to its impe
of the respiratory
recom

ACQUA ACETOSA—is a mineral spring arising in the *Campagna di Roma*, a little distance from Rome, in the direction of Naples. The water is cold, limpid, and inodorous; it is but slightly impregnated with mineralising principles, the chief of which are the chloride of sodium; the sulphates, carbonates, and silicates of soda, lime, and magnesia. There is a thermal establishment at the place which is visited by convalescents from intermittent fever, as well as by others suffering from maladies of the skin, congestion of the abdominal viscera, and certain calculous affections. Although mentioned amongst summer residences, invalids will naturally avoid it at all seasons in which malarial influences are afloat.

ACQUA SANTA—is near to Rome, on the Florence side. This spring recommends itself simply on account of the carbonic acid gas which its waters contain. It is employed as a refreshing beverage during the hot months.

CASTELLAMARE—is situated on the south-east side of the Gulf of Naples, at a distance by railway of about seventeen miles from the metropolis of the country. It is one of several places, within a short distance from Naples, which enjoy the reputation of a healthful summer climate. The prevalent north wind, which gives to this locality in winter a somewhat too keen character for its safe recommendation to persons of delicate constitution, obtains for it the celebrity which belongs to it as a summer residence.

The medical reputation of Castellamare is likewise not a little enhanced by the presence of mineral waters, whose merits were formerly the theme of Galen, Pliny, and Columella, as they are at the present time of the leading Neapolitan physicians. Their reputation exists upon the cure or amelioration of rheumatism, gout, certain paralytic affections, skin diseases, dyspeptic derangements, &c. The

sources of these waters are situated at the foot of Monte d'Auro, and are twelve in number. According to the researches of Sementini, Vulpes, and Cassola, they are characterised in the following manner:—1. *Acqua Ferrata*, a chalybeate resembling that of Tunbridge Wells; 2. *Acqua Rossa*, saline chalybeate; 3. *Acqua Ferrata del Pozzillo*, strong saline chalybeate aerated with carbonic acid gas; 4. *Acqua Ferrata Nuova*, mild chalybeate, having a reputation for the cure of weak eyes; 5. *Acqua Acidola*, slightly saline, and strongly impregnated with carbonic acid gas, prescribed for certain forms of urinary calculi; 6. *Acqua Media*, saline, with carbonic acid gas; employed in some forms of dyspepsia, and as a bath in certain skin diseases; it is not unlike seltzer water; 7. *Acqua della Spaccata*, saline with sulphuretted hydrogen; 8. *Acqua Nuova del Muraglione*, resembles, to a certain degree, the springs of Cheltenham, but stronger in saline principles, and more fully aerated with carbonic acid gas; 9. *Acqua Solfurea-Ferrata*, containing, in addition to what its name implies, saline matter, and fully impregnated with carbonic acid gas; 10. *Acqua Solfurea del Muraglione*, analogous to Harrogate water, with an overplus of saline matter. It is recommended in gout, visceral obstructions, and diseases of the skin, and is prescribed by Italian physicians for the cure of obesity; 11. *Acqua della Rogna*, is also employed in cutaneous disorders; it is impregnated with carbonic acid gas, and contains saline particles, besides a little sulphuretted hydrogen; 12. *Acqua della Tigna*, which is, in all respects, like the last mentioned. A detailed account of the analyses of these various springs, and of their medical utility, will be found in Dr Cox's "Medical Topography of Naples."

Castellamare is built near the site of the *Stabiæ*, where the elder Pliny was cut off, A.D. 79, by the eruption from

Vesuvius. Its temperature is about ten degrees below that of Naples.

COMO, LAKE OF.—This is an extensive lake situated in the province of Como, in Lombardy. Its direction is from north, where it leaves the Lepontine and Rhætian Alps, to south, where it is divided by the promontory of Bellagio into two distinct branches, the western one terminating at Como, and that on the east near Lecco. The length of the lake, from Riva to Como, is thirty-five miles, and its extreme breadth, from Menaggio to Varena, is three miles. It is separated from the Lago Maggiore by a series of intervening valleys which contain the lakes of Varese and Lugano. The scenery of the Lake of Como is the finest of its kind in Italy, and contains in its variety that which will recommend itself to every taste. As a summer residence, it has the advantage over its neighbour [see Lago Maggiore] in being protected, at least in its southern extremity, from the cold winds which blow from the icy regions of the Alps. In consequence of this, the mild season is of longer duration, and is free from those vicissitudes of temperature which render the Maggiore unfit for consumptive invalids. It appears from observation, that the prevalent winds are the north and south, and that they alternate in such a manner, the north blowing generally through the night and the south during the day, as to maintain the atmosphere at a tolerably uniform temperature. The east wind contains a good deal of moisture, and gives rise occasionally to fogs, which are either condensed into rain by the cold or dispersed by the heat, according as the north or south wind succeeds respectively. Bellagio and Varena are reputed amongst the best localities for invalids. For consumptive persons the east side of the lake, near the Lecco division, is considered the most

eligible, since, however inferior it may be as to its natural attractions, it is more consistent and genial as to its climate. The Lake of Como is suitable as a summer residence for those who require at all seasons a mild and equable temperature, and who cannot endure cold and bracing winds; and, *per contra*, it is ill adapted as a residence for persons of plethoric constitution, or such as are of a nervous and desponding temperament.

ISCHIA—is separated from Cape Miseno by a channel six miles in width. It is the largest of the islands of Naples, having an area of twenty-four square miles, and an extreme height (summit of Mount Epomeo) of 2513 feet. It is somewhat triangular in form, presenting a northern, a western, and a southern aspect. Ischia is resorted to as a summer rather than as a winter residence, and is much frequented for the sake of its hot mineral springs. The northern coast of the island is not at all suited for invalids in winter, being affected by a cold predominating wind, and by the moisture resulting from its peculiar configuration, as well as from the luxuriance of its vegetation. On the east and west sides the coasts are exposed to considerable meteorological vicissitudes. The southerly winds give an intense summer heat to the coast in that direction, at a season, however, when the northern aspect is cool and refreshing. Persons requiring a somewhat tonic climate, who are suffering from general debility and nervous prostration, will find Ischia a desirable residence; but their stay should not be prolonged. Nearly all the mineral springs, which are very numerous, flow at a high temperature, so as to require an admixture of cold water before they can be taken internally. Hot air and vapour baths, as well as sand baths, are much used on the island. No person should attempt a course of the waters of Ischia

without considerable precaution in the outset, and on no account without proper medical advice.

The springs have formed the subject of many volumes, the first of which, at all events of those describing their medical utility, being that of Giulio Jasolino, which was published in 1588. Dr Cox, in his work on the "Medical Topography of Naples," has likewise contributed to their reputation, having along with the results of his own observations incorporated those of the researches of many distinguished predecessors. The springs most resorted to are those which make their appearance in the *Valle Ombrasco*, near the village of Casamicciola, and at the foot of Mount Epomeo. The *Gurgitello* is the chief of these; it enjoys a reputation for the cure of many disorders, of which gout, rheumatism, sciatica, ulcers, scrofulous enlargements, paralysis, gunshot wounds, and nervous irritability, are so many. The chief ingredients of this water are the salts (carbonate and muriate) of soda and a full impregnation with carbonic acid gas. It rises at a temperature of 158°. The *Acqua di Cappone* is near the former; it rises at a temperature of 98°, and is remarkable for its peculiar odour of chicken-broth. The *Acqua di Bagno Fresco* or *del'Occhio* is employed in ophthalmic affections. The *Acqua di Tamburo* gives a name to the *Val di Tamburo* in which it rises at a temperature varying between 155° and 210°. It is so called on account of the drum-like noise attending the escape of the carbonic acid gas with which it is surcharged. Besides these there are many others, having very much the same constitution and properties, which are reputed advantageous in sprains, fractures, rheumatic swellings of the joints, scrofula, general atony, dyspepsia, hysteria, visceral obstructions, hypochondriasis, hepatic, renal, urinary, and cutaneous disorders, &c.

LAGO MAGGIORE—is a lake of irregular shape, bounded by Piedmont, Lombardy, and Ticino. It is the westernmost of the extensive lakes of Northern Italy, is forty miles in length, and has a varying breadth of which the average is two miles. Its direction is from north-east, where it leaves the pass of the St Gothard, to south-west, where it terminates at Sesto Calende. The country to the east of the lake is moderately undulating and richly cultivated; at the northern extremity the scenery is bold and imposing, and that on the western shore is similar in character, but diminishes towards the south. The Lago Maggiore is separated from that of Como by a series of intervening valleys, in which are situated the lakes of Varese and Lugano. It is one of those summer residences to which invalids resort, who, having been tempted into Italy by the report of its winter climate, are desirous of passing another cold season in the country without the inconvenience of a long and expensive journey, either into England or, at all events, across the Alps. The summer climate of Lago Maggiore is precisely such as might be chosen with advantage by an invalid whose condition requires a mild but not relaxing atmosphere; yet, whilst tonic, not too keen. The vicinity of extensive glaciers exercises a somewhat chilling influence during the prevalence of northerly and north-westerly winds; and these, alternating with the warmer winds of the south, give an unsteadiness to the temperature which unfits the locality for persons afflicted with consumption. On the other hand, cases of simple relaxation of the system, particularly if there be any tendency to paralysis, and persons of desponding mind and weak digestive organs will find in the cheerful scenery of Lago Maggiore an efficient restorative. Baveno, whence the Isles of Borromeo are accessible.

is one of the pleasantest situations on the lake. Arona and Sesto are both likewise much frequented. Invalids are reminded of the noxious influence of the evening dews and morning fogs, and should be particularly careful to avoid exposure to them.

LEGHORN—is situated in Lat. 43° 32′ 7″ N., Long. 10° 17′ 7″ E. It is the principal seaport in Tuscany, and carries on a large foreign trade; it is intersected by canals, and for commercial enterprise is particularly well provided with docks and warehouses. But in a medical point of view there is nothing attractive about Leghorn; its aspect is a bad one, and the surrounding neighbourhood is flat and humid. It has a mean annual temperature of 61·98; that of winter being 49·78; of spring, 59·65; of summer, 74·96; and of autumn, 63·55. It has within the last few years been resorted to by the Italians as a fashionable summer residence and watering-place, for whose accommodation baths have been erected outside the Porta di Marte. The season lasts from the middle of June to the end of August. At Pozzolenti, two miles from Leghorn on the side of the Porta Fiorentina, are some baths of mineral waters which have a sort of reputation for the alleviation of rheumatic disorders and some skin diseases; they are of the sulphurous order. Others which occur at the base of Monte Nero are characterised by magnesian salts, and are a good deal employed as an internal remedy during the bathing season.

LUCCA.—The baths of Lucca are situated in a deep and beautiful valley of Tuscany, at a distance of about fifteen miles from the town itself, whence, during the summer season, there is an ample choice of conveyance. The road from Lucca to the baths is in many parts very beautiful, and is closed in by hills and mountains variously clothed with olives, vines, and chestnuts. It is the refreshing cool-

its being midway between t
alla Villa, than because of it
tion, both in the way of hote
as of hostelry. Gambling
villages, or groups of lodgin
and *Bagni Caldi*, also afford
The latter of these two is the
being much warmer. There
ments, each containing mine
varying from 87·80 to 132·80.
also as internal remedies in son
But it is rather on account of
than to any merits of the batl
spend the summer in the lovel
situation is very healthy at all
months of June, July, and Aug
chief ingredients of the miner
of lime and magnesia, the chl
of iron.

MONTE-CATINI—a village of
Florence and Leghorn, and co
railway, occupies an agreeable
of Nievole on th

waters are transparent, limpid, and slightly gaseous, having little or no odour, and a strong saline taste. That they are strongly impregnated with saline ingredients, the following analysis of the spring of *Tettuccio*—and the others all nearly resemble it in physical as well as chemical characteristics—is sufficient to show. In a quart of water there are 102·971 grains of the chloride of sodium ; 21·034 grains of the sulphates of soda, potash, and lime ; besides a variety of other salts. The cases in which these waters are chiefly employed are those of hypertrophy of the liver ; of general congestion of the abdominal viscera, and of chronic diarrhœa ; besides several other disorders, in the cure of which their slight claim to be considered as thermal springs renders them less likely to be available.

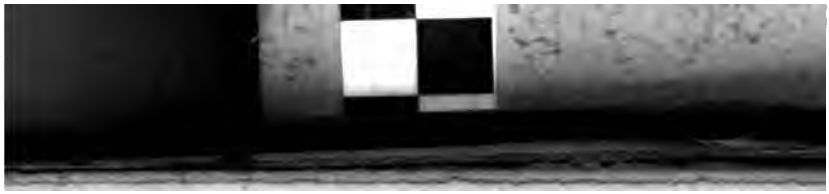
RÉCOARO—a village of Lombardy, nineteen miles north-west of Vicenza, is a good deal resorted to in the summer season for the benefit of its cold chalybeate springs, whose waters are not only made use of on the spot, but are likewise exported in large quantity. It is reached from the railway at Vicenza in four hours by *voiture*. The waters are impregnated with free carbonic acid gas, and contain, moreover, a small quantity of the protocarbonate of iron, in addition to salts of soda and lime. They are slightly tonic and purgative in their effects, and are employed in anœmia, chlorosis, amenorrhœa, hysteria, certain forms of dyspepsia, &c.

SIENA—a city of Central Italy, is situated on the declivities of two hills, at an elevation of 1260 feet above the level of the sea. It is thirty-one miles to the south-east of Florence, with which city, as well as with Leghorn, it communicates by railway. The country around Siena consists of a sterile and desolate plain, but the scenery in the immediate neighbourhood of the town is relieved by the well-

wooded approaches. Siena is somewhat triangular in shape, and is constructed in such a manner as to offer a free circulation to the winds through its streets, many of which, in consequence of the sloping position of the town, are so steep as to prohibit the passage of carriages. The Lizza, constructed on the site of an old fortress, is the promenade to which the inhabitants chiefly resort: it lies on the west side of the town, is rendered attractive by the statues with which it is adorned, and forms a cool retreat in the summer months.

The mean annual temperature of Siena is very low, in consequence of the comparative severity of the winter season. The winds are fickle, and give rise to frequent and sudden thermometric changes. As a summer residence, it is sometimes resorted to by those who intend spending the subsequent winter in Italy, and who wish to avoid the inconvenience of a long journey across the Alps. The climate is dry and bracing, and, as such, is adapted to persons of relaxed habit of body; and indeed to all classes by whom a summer in Italy can be endured. This excepts consumptive invalids, who will at no season find Siena a suitable residence. There are mineral springs (saline and sulphurous) near the town, of which the most important are those of Rapolano on the south side.

Sorrento—is one of the maritime towns of the kingdom of Naples, situated on the headland which forms the southern boundary of the Bay of Naples. It is justly celebrated for the picturesqueness of its locality, and for the beautiful scenery in its neighbourhood. Scientific observations are wanting to enable us to determine the proper position of this interesting spot in the ranks of health resorts; but we may take it for granted that the prolonged observations of such writers as Barzelotti and Renzi have

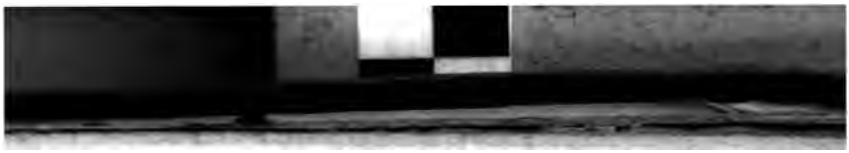


led them to a tolerably accurate deduction, when they maintain that the atmosphere hovering over it is of the purest quality, and of moderate temperature, whilst the general climate is very mild, and subject only in the smallest degree to meteorological vicissitudes. It is, however, rather as a summer resort than as a winter climate that Sorrento enjoys its reputation. Whilst it can scarcely be said to be a cold climate in winter, it is, nevertheless, affected to a certain degree by a prevalence of north winds, which tend to reduce the mean annual temperature; but it is, at the same time, due to the cool influence of these refreshing breezes that the tolerance of a southern summer residence is established. Invalids who can bear a summer in southern latitudes at all, and whose condition renders a prolonged stay in the south of Italy desirable, will find in the mild temperature, lovely scenery, and classic associations of Sorrento an eligible residence. It has been termed the Normandy of the Gulf of Naples; but there are few who will not estimate its delicious orange groves above the apple trees of its archetype.

VICARELLO—a village of Central Italy (*Vicus Aurelii*), is situated on the north side of, and at a little distance from, the Lake of Bracciano. It is reached from Rome by *voiture* in three hours. Vicarello possesses thermo-sulphated saline springs—the *thermæ Aurelii* of the ancients—whose waters rise at a temperature of 113·00, and contain, as their mineralising principles the sulphate of soda, the protocarbonate of iron, and certain alkaline carbonates. Little has been said of their therapeutic effects; but their chemical constitution, as well as their temperature, alike point to that class of cases in which medicinal interference of a slightly purgative, alterative, and tonic kind is indicated.

VITERBO—is situated at the base and northern aspect of

Monte Cimino, at a distance of forty-two miles north-north-west of Rome, whence it may be reached by *voiture* in eight hours. It possesses many mineral springs, which were in vogue amongst the ancient Romans, but only two of which are employed medicinally at the present time, one sulphurous, the other chalybeate. The former of these is impregnated with hydro-sulphuric acid gas, and has a temperature of 123·80. Its waters are used in those cases to which sulpho-thermal springs usually prove beneficial. The latter contains, as its characterising mineral ingredient, the protocarbonate of iron. It has a temperature of 120·20, and is employed as an ordinary tonic in cases of anœmia, chlorosis, certain forms of dyspepsia, &c.



CHAPTER XV.

MADEIRA—AZORES—CANARIES.

MADEIRA.—"*If I must go abroad,*" said the late Dr Andrew Combe, "I shall most likely return to Madeira, on the simple ground that, if I must forego the pleasures of home, it is better to resort at once to the *most* advantageous climate than to adopt the half-measures of going to Italy, Jersey, or the South of England."

Madeira has enjoyed its reputation as a winter resort for invalids from a somewhat remote period. More especially, however, since the middle of last century, its climate has been the study of men of science; and from that period down to the present day, numerous works have issued from the press, all of which contribute more or less to establish the excellency of its character as a suitable retreat for those who are unable to contend against the changeable weather of northern countries. All writers have not so good an opinion of Madeira as we find expressed in the above quotation from the "Life and Correspondence of the late Dr Andrew Combe;" but I am not aware of any author who, having a personal experience of the climate, has refused to endorse the general statements respecting the privileges which it enjoys in those particulars of physical phenomena of chief importance to persons of delicate constitution, and especially to those suffering from diseases of the chest.

...ident—from the strenuous
of difficulties and dangers, t
permanent demand for a sup
ensue, the supply gradually
to the present time kept pace
who visit Madeira during the

The voyage may be perform
ing packets which trade betwee
and are fitted up in a comfor
the Royal Mail steamers, whi
way to Brazil; or by ordinary
voyage is undertaken in favour
the invalid that it should be s
than hastened, because by a sl
liable to the evil consequences
change into an atmosphere consi
which he had been accustomed t
the distance is usually accomplis
and in a steamer in from five to
according to circumstances, var
repeat here what I have said freq
should provide themselves with p
setting out even for Madei-
may be

of the island depends chiefly upon the invalids who resort thither in winter, it is the object of the Government to afford them every facility in making their arrangements; and its injunctions being fully carried out by the officials, travellers to Madeira may divest themselves of a certain amount of uneasiness on that score.

The Madeira Isles form a small group situated in the Atlantic Ocean, and belong to Portugal, from which country they are distant 660 miles in a south-westerly direction. They comprise the island of Madeira itself, the island of Porto Santo, and the islets called the Desertas.

The island of Madeira is situated between 32° 49′ 44″ and 32° 37′ 18″ N. Lat., and between 16° 39′ 30″ and 17° 16′ 38″ W. Long. It is of an irregular oblong shape, having an extreme length of thirty-two and an extreme breadth of twelve geographical miles. Its coast line presents comparatively few indentations, but the surface of the island is greatly distorted by mountain masses, which rise, especially on the north side, to a considerable elevation, and usually sheer out of the water. The island is of volcanic origin, and has generally a rugged but picturesque appearance. The Desertas are about twelve miles distant from Machico; they are three in number, very small, rise abruptly out of the sea, are difficult of access and barren, and are seldom visited. The island of Porto Santo lies twenty-six miles to the north-east of Madeira. It is eight miles in length and three in breadth. Like Madeira it is of volcanic origin, and presents a mountainous surface. Its chief town is on the east coast, and bears the same name as the island itself.

The soil of Madeira is, generally speaking, of a rich alluvial variety near the sea and in the depths of ravines, and in places where it is well watered is tolerably productive; but on the higher grounds it is thin and scanty. The

...ere. The roads throughout
rugged, so much so that one
transport of vehicles, ponies b

Funchal, the capital of the i
from the vast quantity of *fun*
the site upon which the town no
mountain slopes in an amphith
a southern aspect. It rises gr
the level of the sea to an elevati
two and three hundred feet. It
tion is 32° 37′ 7″ N. Lat., and 1(

The town has an elegant appe
the sea, or from an extremity of
it is situated; the brilliant whiten
a pleasing contrast with the green
and with the mountains in the ba
approximation, however, the tow
its appearance. "The streets," sa
dent there, "are irregularly buil
rounded pieces of basalt, about th
from the beach, and with rough l
material, so as to afford a firmer
siderable ascent exists. The lar
class of horses

the streets appear narrow to those unaccustomed to foreign towns; at the same time, they are remarkably clean, and kept in good order and repair. The town is intersected by three rivers, generally dry during the summer months, but rolling down in torrents for short intervals, and with immense velocity during the usually heavy rains of autumn; often bearing enormous boulder stones along with the turbid waters, and at times carrying away bridges in their course, and inundating the lower part of the town."

Many works have been written upon the history, topography, and commerce of Madeira, from any of which the reader may acquire the necessary information respecting domestic and other matters of importance to any one about to spend the winter there. From the writings of Fothergill, Heberden, Adams, Gourlay, Kirwan, Pitta, Kæmpfer, Mason, White, Harcourt, M'Euen, Barral, Heineken, Renton, Lund, Burgess, and many others, as well as from Sir James Clark's work on Climate, the reader, desirous of further information than I have space to afford him here, may likewise obtain more detailed accounts of the medical characteristics of Madeira.

The peculiarities of the climate of Madeira are its general mildness and equability; its freedom from extensive ranges of temperature, and from many other circumstances which keep the invalid within doors in this country. Its geographical position prevents excessive cold, whilst refreshing sea-breezes moderate what might otherwise amount to inordinate heat. The atmosphere is generally charged with moisture almost to saturation; but it is neither loaded with dust, nor impregnated with noxious emanations, both of which are baneful elements in some of the reputed winter climates of the south of Europe.

Whilst, however, the climate of Madeira is marked by a

general uniformity and regularity, it is not by any means destitute of seasonal changes, nor of occasional storms of wind and rain. Besides this, every year presents its own peculiarities more or less, being either more or less rainy, warmer, colder, or more or less stormy than the preceding one. The seasons are not so sudden in their changes, however, nor are they so wide in their extreme range of temperature as in northern climates. Neither the cold of winter nor the heat of summer is sufficient to destroy the vegetation in the vicinity of Funchal. Winter at that place is the most agreeable season of the year. It has a genial temperature, and the atmosphere is then usually clear, or at most but slightly clouded, whilst the occasional rains which fall do not prevent the invalid from taking a sufficiency of outdoor exercise. Nevertheless there are some days, and many mornings and evenings, in which a fire is necessary; for, however mild the climate may be, there are always times when the atmosphere, without being actually cold and wet, is still sufficiently moist and chill to demand of the invalid a careful protection from its insidious influence. The change from winter to spring is not one of a striking character, at least in point of temperature, although the latter season is sometimes attended with heavy rains. In summer the heat at Funchal is too oppressive to permit of its being an agreeable place of residence, especially to invalids; but there are many places in the island which afford cool and agreeable retreats during the hot months. Heineken believed that Madeira was more useful to invalids in summer than in winter, and some find it convenient to live in the island entirely; but comparatively few persons would submit to an expatriation so prolonged, especially where the internal resources of amusement are not more numerous than in Madeira.

Meteorological Table for Madeira.

Observation.	Year.	Seasons.				Months.												Authority.	Years of Observation.
		Winter.	Spring.	Summer.	Autumn.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
Mean Temperature,	69·18	64·69	66·40	72·46	73·20	64·00	63·80	66·5	66·45	66·25	69·06	73·00	75·4	74·93	73·87	70·82	66·27	Heberden.	1749–50
	68·94	64·49	65·84	72·73	72·68	64·18	64·30	65·5	65·5	66·53	69·74	73·45	75·02	75·76	72·50	69·80	65·00	Kirwan.	Four.
	63·60	59·23	60·66	68·00	66·33	59·	59·	60·	60·	62·	66·	70·	68·	69·	67·	63·	60·	Gourlay.	1800
	64·96	60·60	62·36	69·56	67·30	59·71	60·28	61·86	62·03	63·44	66·90	70·04	71·88	71·28	66·76	63·96	61·44	Heineken & Renton.	1826–31
	66·53	61·87	65·59	69·63	69·03	60·24	61·12	63·43	65·39	67·97	64·44	71·68	72·78	72·16	69·49	65·45	64·25	Mason.	1834–35
	...	65·33	64·66	...	...	64·	65·	63·	64·	67·	...	...	...	...	70·	67·	67·	Young.	1848–49
	...	62·63	63·70	...	...	61·7	62·5	63·5	62·3	65·3	...	...	...	...	...	...	63·7	M'Ewan.	
	67·25	63·30	67·47	69·12	69·14	62·18	64·94	64·63	68·35	69·43	66·84*	69·82*	70·71*	70·01*	70·58	66·85	62·80	White.	1850–51
Mean Daily Range of Temp.,	5·05	6·11	5·82	3·47	4·66	7·08	5·71	5·67	6·31	5·48	3·54*	2·87*	4·01*	4·23*	4·14	6·30	5·56		
	9·81	9·93	9·41	9·53	10·38	9·15	10·17	9·79	9·39	9·05	8·73	9·82	10·05	9·83	10·56	10·76	10·48		
Mean successive Daily Range,	1·11	1·48	1·03	0·76	1·15	1·83	1·40	0·90	1·30	0·90	0·80	0·70	0·80	1·23	1·13	1·10	1·23	Heineken & Renton.	1826–31
Mean Extreme Daily Range,	31	21	22	24	25	18	20	17	17	19	17	16	17	16	19	19	19		
Barom. Mean Height,	29·86	30·02	29·96	29·53	29·93	29·91	30·05	29·98	29·91	30·00	29·49	29·55	29·56	29·66	29·97	30·17	30·11	White.	1850–51
	30·00	29·97	29·96	30·04	29·95	29·91	30·05	29·98	29·91	30·00	30·06	30·07	30·01	30·01	29·97	29·87	30·03	Heineken & Renton.	1826–31
Barom. Extreme Range,	1·06	0·69	0·48	0·22	0·43	0·69	0·59	0·46	0·66	0·33	0·26	0·19	0·22	0·29	0·36	0·66	0·53		
	0·46	0·66	0·48	0·24	0·47	0·69	0·59	0·46	0·66	0·33	0·22	0·29	0·21	0·36	0·77	0·29	0·70		
Rain. No. of Days,	66	12	16	15	23	3	1	9	2	5	6	4	5	10	12	1	8	White.	
	70	23	18	6	22	13	5	6	9	3	2	1	1	4	6	11	5	Heineken & Renton.	1850–51
Rain. Amount (inches),	29·23	11·40	5·77	1·45	10·61	5·92	1·46	2·21	2·30	1·26	0·73	0·26	0·46	0·92	1·66	8·03	4·02		
	...	2·875	2·083	...	...	1·655	·094	3·636	·840	1·775	·420	...	...	...	5·607	·090	6·877	White.	

* At Machico.

The annexed meteorological table I have prepared from the works of the authors whose names were previously mentioned; and as I have given the results obtained by the different observers in full, it scarcely requires many words of explanation. It will be seen that with a high winter and spring temperature, that of the whole year is comparatively low, being about 66°. This is owing to the modifying influence of the summer temperature, which, for the position of the island, is remarkably low, being, in fact, several degrees below that of Italy generally, and not more than seven or eight degrees higher than that of London. The mean annual range of temperature is likewise very moderate when compared with other winter resorts; and the successive daily, weekly, monthly, and seasonal changes are characterised by their smallness and regularity. The difference between the temperature of day and night is likewise small.

There are occasions when perceptible changes are felt in the state of the atmosphere. With a northerly wind, whilst there is a little snow in the mountains, a sense of coldness supervenes; and, on the other hand, when the *leste* prevails, an uncomfortably high temperature results; and at such seasons, as well as in others when falls of rain occur, the climate of Madeira is not so agreeable as an invalid would like; but, in comparison with other places of winter resort, these discomforts are of rare and brief occurrence. The highest summer temperature, in the shade, at Funchal is not more than about 82° (except during the prevalence of the *leste*), and that only for a short period, and in the heat of the day; whilst the thermometer scarcely ever falls below 51° during the night in the depth of winter. The barometric range is small and equable.

Surrounded as it is by a wide extent of ocean, it is

natural to suppose that the atmosphere will be charged with moisture, and that such is the case, is readily observable in the rapid oxidation of metals exposed to it, and in the slow manner in which botanical specimens or wet garments become dry. The moisture does not exhibit itself in the form of fogs or even of dense clouds, the high temperature and the constantly interchanging currents of air being sufficient to hold it in a condition of extreme tenuity. Dew is even comparatively rarely observed. It is to its humidity, as well as its mildness of temperature that the climate of Madeira owes that softness so gratifying to invalids who cannot bear a dry and irritating atmosphere. The hygrometer occasionally notifies sudden changes in the amount of moisture in the atmosphere; but these changes do not bear a calculable relation to the condition of the air with respect to rain: sometimes during heavy rains of short duration the hygrometer marks no particular increase of humidity, whilst, on the other hand, it may exhibit a high degree of atmospheric moisture when there is no appearance of rain. Nor is the direction of the wind at all times a safe guide to the condition of the air in respect of moisture, although in general terms it may be said that south and west winds increase, whilst those from the north and east diminish, the humidity.

Whilst the summits of the mountains are rarely without a covering of clouds, the atmosphere in the lower parts of Madeira is usually clear and serene. Even the loftier elevations, however, are generally clear during the early morning, the evening, and during the night, when the stars are remarkably brilliant.

Rain falls in greater or less quantity in every month of the year. The number of rainy days, and the quantity of rain in inches, has been differently estimated by various

authors; but all agree in the main. There is usually less rain in summer than winter, and perhaps more in spring and autumn than in the other seasons. The rain-fall is sudden and heavy, converting, in a very short time, the dry water-courses into violent torrents. It usually falls perpendicularly, being but seldom driven by the wind. The showers are ordinarily of short duration, seldom lasting longer than a few hours, and very rarely for a whole day or night. At Funchal, as at other places, each year has its peculiarity, it may be either moderately, or very rainy, or dry. Heberden gives 32·021 inches as the mean annual amount from an average of the years 1747–50. In the observations by White, given in the table, the pluviometer was not exposed during the months of July, August, and September. Occasionally one or more months pass over without rain. Heineken noticed this particularly in February and August. The south and west winds are regarded as the rainy, and those from the north and east as the dry ones. Rain frequently falls in the mountains at a time when Funchal is enjoying fine dry weather. Hail rarely falls in the town, and it may be said that snow is never known there, although scarcely a winter passes without a few days of snowy weather in the mountains.

Storms at sea are not of frequent occurrence in the vicinity of Madeira, although there are many on record remarkable for their severity and destructive effects. The position of the island, and the chain of mountains running in an east and west direction across it, modify the influence of the various winds, the north side of the island being protected from the hot winds of the south, whilst Funchal is protected from cold northerly winds; it is, however, somewhat exposed to the east and west winds. From local peculiarities the winds in the vicinity of Funchal are

chiefly those from the south and west. Land and sea breezes interchange every day with the utmost regularity; in summer they are from the north-north-east and the south-south-west. The north-east wind is the prevalent one throughout the greater part of the year over the whole island; it predominates at least in summer and autumn, and perhaps scarcely less in winter. In spring the south-west and north-west winds prevail. Although a high wind is very rarely observed in Madeira, yet the atmosphere is almost never calm, there being constantly a gentle breeze in one or other direction. The north-east and south-west are the vehement winds.

The *Leste* is the baneful wind of Madeira. It generally blows three, or four, or more times in each year, approaching from an east-south-east direction, and giving rise to increase of temperature and an unpleasant dryness of the atmosphere. It owes its disagreeable character most probably to its previous passage across the African Desert; but unlike the sirocco, as it affects the inhabitants of the Italian coast, being hot, humid, and depressing, the *leste* is hot, dry, and stimulating, and is at distant intervals loaded with a fine sandy dust, which is very irritating to the air-passages. This wind is sometimes very vehement; it rarely continues longer than three days, and is usually followed by rain. During its prevalence the thermometer frequently indicates a temperature of 85°, and even at rare intervals of 95° in the shade; this, of course, depends upon the season.

The effect of this wind upon the inhabitants of Madeira is very distressing, and much more so upon delicate visitors. The air enters the lungs with a feeling as if it had been previously heated in an oven; the skin, the tongue, and the lips become parched; the eyes feel stiff and readily

inflame, and the entire animal economy is disordered. I is dreaded by the lower animals as well as by man Articles of furniture shrink and crack under its searching dryness. There are instances, however, of persons to whom this wind is not unpleasant; but, generally speaking, all who can do so keep within doors during its prevalence avoiding exposure to it as much as possible.

Many of the diseases to which the inhabitants of Madeira are subject have their origin in the deprivations to which they are exposed rather than to any defects in the sanative powers of the climate. Elephantiasis and Lepra, for instance, loathsome skin diseases, so frequently encountered in the hospital of Saõ Lazaro, have their cause in scanty living, insufficient clothing, and neglect of cleanliness. Pulmonary consumption, too, which is by no means absent from the island, is no doubt in a great measure the result of ill-feeding, unhealthy habitations, and irregular habits. The ordinary diseases of childhood are of rare occurrence; such as whooping cough, scarlatina, measles, &c., and when they do assume an epidemic form, they are invariably milder than those of northern countries. Near the end of summer a fever of the typhoid type occasionally attacks the inhabitants; but it never amounts to an epidemic, although it often proves fatal in sporadic cases. Dysentery sometimes attacks the lower classes in a severe manner; and inflammatory diseases of the bowels are of frequent occurrence amongst the working people, occasioned by an incautious drinking of cold water whilst in a condition of great heat and fatigue. Rheumatism rarely manifests itself in the island, and those who have suffered from it in other countries frequently derive great benefit from a sojourn there. Dyspeptic disorders, especially those of a low nervous, atonic order, are by no means uncommon; depression

of spirits, attended by an insufficient action of the liver, and hæmorrhoids, is likewise a condition frequently met with. And here, perhaps, I might mention in a single word, that the climate of Madeira exerts a purely *sedative* influence upon the constitution, and therefore persons requiring a *bracing* atmosphere should avoid it. Invalids on landing in Madeira are frequently subject to a mild attack of diarrhœa; but this circumstance need not be a cause of alarm to them; a little careful attention to diet will soon rectify it.

Authors differ widely upon the question of pulmonary consumption in Madeira; some affirm it is of rare occurrence, others believe it to be very frequent. Without going into the question at all, which want of space forbids, we may fairly assume that many fatal cases of consumption occur amongst the inhabitants every year; but that they are confined chiefly to that class which suffers most from deprivation of food, clothing, healthy habitations, and other necessaries of life. Scrofula, too, is no uncommon disorder, and it arises from similar causes.

As to the cure or alleviation of many diseases of the respiratory organs, there can be no doubt that the climate of Madeira is worthy of the encomiums which all who have had experience of its effects have bestowed upon it.

The invalid will bear in mind that the atmosphere exerts no specific influence in the cure of his disorder. In bronchial, laryngeal, or pulmonary disorders, it operates upon the disorganised structure in a soothing manner; it does not irritate it in the same way as that of his own country would do, and of which he will probably have had sufficient experience, and therefore he is placed in a better position for allowing nature or art to effect a cure of his malady. But he must cautiously avoid all causes of inflammatory attacks. Ordinary colds and inflammations

may be readily set up in a weakened structure, even in Madeira; and to escape them he must pay particular attention to his clothing, and must, moreover, avoid undue exposure to the chill air of the mornings and evenings, as well as to that which prevails on every damp day. Diet, exercise in the open air, baths, agreeable well ventilated and dry apartments, are important matters to be attended to, as elsewhere mentioned.

Another question of preliminary importance arises as to the stage of pulmonary consumption at which patients may safely be sent to Madeira. Obviously, the answer is, that the sooner they go the better. As a preservative against the development of pulmonary consumption in those liable to it by hereditary transmission, the climate of Madeira, equally with those of other favourably situated countries, is most beneficial. Some cases, it is true, are benefited by a removal to a warm climate at a much later period; but it is far better to send a patient away early, when a cure may be hoped for, than at a more advanced stage of the disorder, when a simple prolongation of life through a brief span can alone be expected. In recommending change of climate as a remedial agent, I would never urge it in any case in which I thought there would be the least likelihood of the patient terminating his or her existence abroad. Far better let them stay at home, or even forbid them to go, than risk the danger of their dying homeless and friendless.

Some physicians have recommended a residence in the island of Madeira throughout the year; and no doubt there are certain localities in which the heat of summer is by no means oppressive. Dr Heineken especially recommended that invalids should remain in summer: he thought that a winter spent in the West Indies and the summer at Madeira

would be a convenient and profitable arrangement. Opinion preponderates, however, in favour of the invalid's return home during the warm months, and in that I certainly concur. Any place on the continent, however, might be selected as the summer resort, at the option, or as might suit the convenience of the invalid.

Having opened these remarks on the climate of Madeira with the words of Dr Andrew Combe, I close them with those of Dr Heineken; they both judged of the climate by its influence upon their own pulmonary disorders. In a private communication to Sir James Clark, Dr Heiniken said:—"As a permanent abode, I believe Madeira surpasses every other place, because it contains within itself the means of equalising the annual temperature more completely than any other spot with which we are acquainted. The *lowest* to which a thermometer exposed all night in a north aspect has ever fallen in Funchal during five years, is 50°, and the *highest* to which it will ever rise, at such a distance up the mountains as would in every respect suit an invalid, need never exceed 74°. The sirocco [*Leste*] visits us so seldom, and its heat may so readily be avoided by closing the doors and windows, that it need not be taken into account. The mean annual diurnal range is from 8° to 10°; but an invalid may, with ordinary precaution, and without the aid of fires, live in a temperature never varying within doors more than perhaps 6° throughout the twenty-four hours. In a few words, I would say, there is no occasion for a person, throughout the winter in Funchal, to breathe, night or day, within doors, an atmosphere below the temperature of 64°; or in the country, and at such a height as to insure dryness, above that of 74°; that he may, during the summer, take abundance of exercise, by choosing his hours, without ever exposing himself to oppressive

heats; and that in the winter he need not be confined to the house the whole day, either by wet or cold, more perhaps than a score of times. Could I," he concludes, "enjoy for a few years a perpetual Madeira summer, I should confidently anticipate the most beneficial effects."

AZORES.

The Azores, or Western Isles, constitute a group of islands, placed in an irregularly extended line, at unequal distances from each other, in the North Atlantic Ocean, between Lat. 36° 55′ and 39° 44′ north, and Long. 25° 10′ and 31° 16′ west. They are nine in number, and bear the following names, taken from east to west: St Mary, St Michael, Terceira, Graciòsa, San Jorge, Pico, Fayal, Flores, and Corvo. They belong to Portugal, from which country they are distant about 800 miles, in a westerly direction.

These islands are all of volcanic origin, and are similar in their leading features, having a broken, elevated, and undulating surface, with an almost entire absence of table land. The volcanic masses shoot up into frequent peaks, of which that of St Mary's (the lowest) is 1869, and that of Pico (the highest) is 7613 feet high. The islands generally rise perpendicularly out of the ocean, and their coast lines are bold and precipitous. Although originally possessed of forests, they have none now, agricultural pursuits, volcanic phenomena, and domestic requirements, having made an entire clearance of them.

The climate, like that of the Atlantic islands generally, is characterised by its mildness and equability, as well as by its humidity. The extreme annual range of the thermometer is rather greater than that experienced in Madeira, being from about 48° (January) to 82° (July). The lowest

temperature on record is 45°, and the highest 86°, both in the shade. The mean successive range of temperature from month to month is, on an average, less than four degrees. Of the several islands forming the group of the Azores, I shall confine myself to a particular account of one only, St Michael's.

ST MICHAEL'S ISLAND—is the largest of the Azores, and occupies a position in Lat. 37° 44′ north, and Long. 25° 30′ west. Its extreme length, from east to west, is 36 miles, its superficial area being estimated at 224 square miles. The eastern extremity of the island rises boldly out of the ocean, presenting the form of a sea-cliff, having an elevation of from 1200 to 1400 feet. From this extremity the surface gradually rises to a lofty inland peak, whence a central range runs to the west, terminating in the Serra da Agoa de Pao, at an elevation of 3070 feet above the level of the sea. Still further to the west the surface is lower, presenting volcanic hills of 1200 to 1400 feet in height, and finally terminates in the Serra Gorda, at an elevation of 1574 feet.

The surface of the higher parts of the island is for the most part occupied by evergreen shrubs, which give a freshness and a wooded appearance of greater value than the island really possesses. The general surface is uneven and irregular, presenting many deep ravines, which give passage to the water flowing from the mountains. In many parts the ground is covered with a hard and brittle scoriaceous lava, which is entirely destitute of vegetation. There are four lakes upon the island, all of which occupy cavities of volcanic formation, and are supplied by the rain water, which is guided to them along the declivities of the surrounding peaks.

Besides the springs yielding the ordinary drinking water, which contains no unusual substances, there are several mineral springs of reputation, the waters of which are used

as medicinal agents by the inhabitants. They are divided into four distinct classes, namely,—1. *Caldeiras*, or Boilers, which have a temperature of 210°, and contain, besides sulphuretted hydrogen and carbonic acid gases, a small proportion of silica, together with alkaline carbonates, and some neutral salts. 2. The thermo-chalybeate of the *Quenturas*, which contains, besides carbonic acid gas, small quantities of the carbonates of lime and soda, together with the chlorides of sodium and potassium, and the silicates of soda and potash. Their ferruginous ingredient is the carbonate of the protoxide of iron. 3. The *Agoa Feuca*, of a similar class with that last mentioned, but of lower temperature, and more powerfully chalybeate. 4. The *Agoa Azeda* (acid water), a cold acidulated spring, containing, in addition to its carbonic acid gas, a trace of iron, and minute quantities of the salts of lime.

The water of the *Caldeiras* is employed in the form of baths only, and exercises the ordinary effects of sulpho-thermal waters. Its use is recommended in cases of chronic rheumatism, in certain forms of paralysis, and, it is said with advantage, in obesity, the result of too high living with physical inactivity. In the treatment of chronic gout, and in calculous affections, as well as in the syphilitic cachexia, it is reputed efficacious. The thermo-chalybeate of the *Quenturas* is recommended in convalescence from active disease, when administered cautiously, and in many of the disorders incidental to the female sex. The same may be said of the *Agoa Feuca;* but it is less used than the Quenturas. The *Agoa Azeda* is used almost exclusively as a medicinal beverage; it acts as a diuretic, and gives a fillip to the circulatory and nervous systems. In atonic dyspepsia, and in cases of general debility, it is useful. It is occasionally employed as a cold bath.

The coast line of St Michael's is studded with numerous towns and villages, of which the chief are *Ponta Delgada, Alagoa, Villa Franca,* and *Morro-das-Capellas.* Ponta Delgada is the capital of the island, and affords moderate accommodation for visitors; many English and American merchants reside there. Villa Franca is more agreeably situated than Ponta Delgada, and would be better suited for invalids, but unhappily it affords no accommodation for them.

The inhabitants of St Michael's present great variety in their physical constitutions; they are of middle size, and though spare in form, they are healthy and active. The diseases which manifest themselves are usually of an asthenic variety. They are such as might be anticipated in a warm and humid, sedative climate: gastrodynia, atonic dyspepsia, rheumatism, neuralgia, humoral asthma, scrofula, and subacute affections of the respiratory apparatus. Dr Bullar, who wrote an excellent account of the island, believed that consumption was rare: in a sojourn of 150 days in which he was actively employed amongst the sick, he only saw two cases. The poorer inhabitants are generally industrious, regular, and cleanly in their habits, and perhaps that may account for the fewness of consumptive cases; but they frequently suffer from insufficient diet. The rich, on the contrary, are exposed to disorders arising from too luxurious living combined with sedentary occupations.

The climate of St Michael's is soft, equable, and humid, and exercises a purely sedative and relaxing influence upon constitutions newly, and for a time, exposed to it; and upon the inhabitants themselves it never has an invigorating effect. Winter presents very few days in which the revivifying power of the sun is not felt, and there is scarcely

ever a day in which out-door exercise may not be taken, more or less. In summer the sea breezes mitigate the heat, and clouds for the most part intercept the sun's rays in such a manner as to afford a certain degree of shelter. The average annual range of the barometer is from 29·46 to 30·69 inches, the mean annual, seasonal, and mensual temperature being as follows:—Annual, 62·43; winter, 57·87; spring, 61·17; summer, 68·33; autumn, 62·33: January, 59·00; February, 59·00; March, 59·50; April, 61·00; May, 63·00; June, 67·00; July, 68·00; August, 70·00; September, 68·00; October, 63·00; November, 56·00; December, 55·6. The mean annual quantity of rain which falls at St Michael's is about thirty inches on the sea-board, whilst in the higher districts it is probably not less than fifty. Of the thirty inches twenty-one are said to fall during the colder and nine during the warmer months. In summer, therefore, vegetation in the lower districts languishes, and the ground becomes dry and dusty. The atmosphere is always saturated with moisture; so much so that in his account of the island, Sir James Clark says:—"Boots grow mouldy in a few days, kid gloves become spotted, books feel damp, and clothes not constantly worn have a musty smell. To prevent these inconveniences, the inhabitants frequently expose their clothes to the sunshine."

According to Mr Hunt (in the *Journal of the Geographical Society*), the mean number of calm days in the year is nine; the north wind blows, on an average of five years, on 27 days, the north-east on 110, east on 20, south-east on 40, south on 17, south-west on 51, west on 20, and the north-west on 71, giving a ratio of 37 to 26 of northerly and easterly winds over those from other points of the compass. Storms at sea are usually neither frequent nor of long duration.

As a resort for invalids the Azores are not so attractive as the Madeira group, and, unless other circumstances should lead to a preference for them, it would be generally advisable to recommend the latter, not only because the climate is pretty much of the same quality, and the means of access more commodious, but also because there is in Madeira a wider choice of accommodation, more society, and greater facilities for obtaining the necessaries and luxuries of life. Madeira, too, is midway, in point of meteorological phenomena, between the Azores and Canaries, being less warm and humid, and possessed of a scantier vegetation than the former, whilst it is warmer, less arid, and not so sterile as the latter. In summer Madeira, being affected by the trade winds, is cooler than either of the above groups.

In dry irritable bronchitis, or a similar class of affections of the larynx, occasionally in irritable dyspepsia, and in the premonitory stage of consumption, a winter's residence in the Azores might be beneficial, especially if the patient could devise any other excuse for going there besides his malady, either in the way of business, or the pursuit of pleasure.

CANARIES.

The *Fortunatæ Insulæ*, are situated in the Atlantic Ocean, at a distance of sixty miles from the west coast of Africa, between Lat. 27° 40′ and 29° 25′ north, and Long. 13° 25′ and 18° 16′ west. The group comprises seven principal islands, and several islets, which are named as follows, in their order, from east to west:—*Lanzarote* and *Fuerteventura*, with the islets, *Graciosa*, *Santa Clara*, *Alegranza*, and *Lobos*: *Gran Canaria*, *Teneriffe*, *Gomera*, *Palma*, and *Hierro*

(*Ferro*). The area of the entire Archipelago is estimated at 4000 square miles. Like the groups of Madeira and the Azores, the Canaries are of volcanic origin, their coasts are bold, abrupt, and rocky, and their surface is broken up by mountains, of which the loftiest, *Pico de Teyde*, in Teneriffe, is 12,182 feet high. The higher elevations are quite destitute of vegetation, and in this respect differ widely from the Azores. There are no rivers in the islands; but after heavy rains, torrents pour down the mountain slopes and ravines. The surface is diversified by fertile plains and valleys. In some of the southern islands there is a scarcity of potable water, so that occasionally, after a prolonged dry season, the inhabitants are obliged to emigrate.

TENERIFFE is the largest of the Canary Islands, being 74 miles in length and 35 in breadth. Its chief towns are, Santa Cruz, Orotava, Laguna, Icod, and Guiamar.

SANTA CRUZ—on the south-eastern coast, is the capital of the island, and is a moderately clean and comfortable town, without any pretensions to those comforts which visitors from this country, and especially invalids, like to encounter. Except at a low level the neighbourhood is barren in the extreme, and dry. Orotava, on the north-western side of the island, is surrounded by more attractive scenery than Santa Cruz, and the town is in every way better adapted for the use of invalids; its climate being softer, its accommodation of a better description, and its scenery more attractive. Teneriffe is the only island of the group which possesses eligible accommodation.

The climate of the Canary islands differs from those of the Madeira and the Azores groups, in being warmer and less humid. At Santa Cruz the mean annual temperature is considerably above that of Funchal, whilst the seasonal temperature is widely different, especially that of summer

when Funchal has a decided advantage. Where a dry climate is a desideratum equally with mildness, Teneriffe is superior to Madeira.

LAGUNA—the ancient capital of Teneriffe, situated on a lofty and healthy plain on the north side of the island, has a much lower temperature than Santa Cruz: the difference may be shown thus:—

	Santa Cruz.	Laguna.		Santa Cruz.	Laguna.
Annual, .	71·15	62·63	May, . .	72·12	62·00
Winter, .	64·85	56·42	June, . .	73·89	65·00
Spring, .	68·87	59·75	July, . .	77·29	68·88
Summer, .	76·68	68·29	August, .	78·89	71·00
Autumn, .	74·17	66·06	September,	77·43	70·00
January, .	63·84	55·25	October, .	74·66	66·19
February,	64·29	56·00	November,	70·43	62·00
March, .	67·17	58·13	December,	66·42	58·00
April, .	67·73	59·13	... .	...	...

The east and south-east winds are very hurtful to the inhabitants of this group of islands. They arrive after crossing the parching deserts of Africa, and have a withering influence both on animal and vegetable life.

The climate generally is not so relaxing as that of Madeira, and would therefore be better adapted to persons with whom a decidedly humid climate would not agree; but it cannot be regarded as invigorating or bracing. By judiciously moving about from place to place the invalid might regulate the temperature to suit his condition.

CHAPTER XVI.

SPAIN—PORTUGAL—GIBRALTAR—MALTA—IONIAN ISLANDS—
—EGYPT—WEST INDIA ISLANDS.

SPAIN.

SUCH was the wretched accommodation afforded to strangers in this country but a few years ago, and so great were the inconveniences and dangers which befell the traveller, both in his journeyings from place to place and during his residence in any particular town, that few people could be induced to visit it for the sake of pleasure only; whilst to invalids in search of health it offered no advantages capable of winning their minds from places of easier access and of more interesting associations.

Latterly, however, Spain has been brought into closer competition with other reputed winter resorts, and is believed, by a few physicians who have had personal experience of its climate, especially by Dr Francis, to possess many qualifications of a climatological character, which ought to obtain for it at least an equal amount of patronage to that bestowed upon any other European country.

It must be admitted that of late years Spain has undergone a small measure of reform in the matter of sanitary regulations, in the treatment of visitors by the inhabitants, in the character of its habitations, in the method of travelling, and in some other respects, all of which tend to im-

prove it as a winter resort for invalids; but these reformations are neither rapid, continuous, nor extensive; and therefore it cannot be pretended that it is in a position at present to divert the tide of annual emigrants from this country exclusively to its own shores. Independent of her internal deficiencies, Spain has other difficulties to contend with in her endeavours to claim a measure of public patronage. Her shores are not so easy of access as are those of many other lands, and a journey through the country is a question not to be entertained by thorough invalids; for the inconveniences, exposure, and fatigue attending such an undertaking would be extremely injurious to a person of slender constitution. The only choice of access in such cases is that direct from Southampton to Gibraltar, or from Marseilles to one or other of the ports in the Mediterranean.

In a geographical point of view, and in its maritime relations, however, Spain is remarkably situated. Its southern shores lie nearer the equator than any other European country possessed of eligible winter climates, whilst its relations with the Atlantic and the Mediterranean are such that its climate cannot fail to receive from them a mild and softening influence. Many of the towns in the southern provinces are well adapted, on account of their general aspect, as well as their surrounding attractions, for invalid residences; and, indeed, in all the natural elements of a good winter climate the country abounds, so that when Art has provided for bodily comfort in a manner commensurate with that in which Nature has bestowed gratification for the mind, Spain may justly aspire to the position of a first-class winter resort.

It is in the south-eastern provinces alone that mildness of climate, the invalid's desideratum, is to be found. The

northern portion of the country, including the provinces of Catalonia, Arragon, Navarre, Gallicia, the Basque Provinces, the Asturias, and parts of the Castiles, endure cold winters and damp and fitful springs, the summer and part of autumn being the only agreeable seasons for travelling. The middle portion of the country consisting chiefly of lofty table-land, includes the Castiles, parts of Leon, Estremadura, and La Mancha. Its climate partakes of the *excessive* order, having cold and piercing winters and scorching summers. Spring and autumn are the only agreeable seasons for travelling. The southern division, comprising Andalucia, Murcia, and Valencia, has a mild winter and spring climate, but is too hot for invalids in summer and autumn.

The following remarks upon some of the Spanish towns are intended simply to convey a general idea of the character of the climate. For information respecting the means of reaching them, and concerning their internal arrangements, I recommend the reader to peruse Mr Ford's (Murray's) "Hand Book for Spain;" and for further details of their climatological peculiarities, the works of Dr Francis and Edwin Lee, Esquire, will be found to contain all the available information down to the present time.

ALICANTE—a seaport of Spain and capital of the province of the same name, is situated on a bay in the Mediterranean in Lat. 38° 20′ N. and Long. 0° 27′ W. The town is protected from the north and north-west winds by a lofty rock of limestone formation. Its inhabitants, about 20,000 in number, are generally healthy, and attain a good old age, having no particular circumstances around them to give rise to a fatal epidemic of any kind. The surrounding country is remarkable for its dryness, and is free from paludial emanations. Comparatively little rain falls at

Alicante, the annual number of rainy days (including nights, and every shower of rain however slight) was ascertained by Mr Satchell, from several years' observation, to be only forty-five. There are no meteorological data, so far as I am aware, by which to determine the annual and seasonal temperature of Alicante; but it is note-worthy that snow rarely occurs in winter, and that even in the coldest years ice is seldom seen. The winds are seldom boisterous; and it is well that it is so, for otherwise the atmosphere would so frequently be filled with dust as to prove injurious to health.

The diseases peculiar to Alicante appear to be chiefly those affecting the nervous system, of which apoplexy, paralysis, and chronic cerebral affections, are the most common. Pulmonary consumption is not uncommon, and it has even been stated that one-fifteenth of all deaths are caused by it. Diseases of females are usually aggravated by the climate of Alicante, hysteria, frequently of a severe form, being a common disorder amongst the female portion of the inhabitants. Colds and rheumatism are met with occasionally in winter, and in the warm months diarrhœa and dysentery sometimes prevail.

The country in the immediate vicinity of Alicante is destitute of natural attractions, but at a short distance the scenery is of a pleasing description. As a winter residence for invalids, therefore, the locality should not be selected by persons whose respiratory apparatus will not bear a dry and somewhat stimulating atmosphere, nor is it well calculated to impart health and vigour to those of depressed spirits. In the atonic variety of dyspepsia, as well as in chronic bronchitis with a profuse mucous secretion, it might be beneficial. Dr Francis says of it:—"The principal circumstances by which Alicante recommends itself as a place

of residence for invalids are; its mild, constant, dry climate, warm nights, comparative freedom from high winds, and the general healthiness of its situation; the number of our countrymen who have long been settled there as merchants, and have introduced English wants and habits; the ready accessibility of the town by means of steamers; and its open unruffled sea."

BARCELONA—in point of population the second, and in respect of its commerce the first city in Spain, is situated upon the shores of the Mediterranean, in Lat. 41° 22′ 36″ north, and Long. 2° 11′ east. It is a strongly fortified city, and contains, together with its suburbs, a population of 250,000.

As a resort for invalids Barcelona is perhaps scarcely a town to be generally recommended. It is seldom that populous towns, unless such as are rendered attractive by peculiar historic associations, or by the possession of eminent works of art, are selected by invalids who are obliged to migrate in winter to a more genial climate. Barcelona is a busy, active seaport town, and to those who enjoy the bustling scene of a commercial emporium it may afford that mental occupation which, in some instances, plays an active part in the alleviation of bodily suffering.

Partially protected by neighbouring hills from cold winds, Barcelona enjoys a mild winter temperature of about 50°, and mean annual temperature of 63°. Rain falls on sixty-nine days. In spring the weather is somewhat fitful, and during April and May cannot be depended upon. The summer temperature is comparatively mild, and is never very oppressive, especially in the suburbs.

The inhabitants of Barcelona are generally healthy, a circumstance in a great measure due to their industrial and sober habits. The climate may be classified with those of

a rather dry and stimulating character, and hence will not be suitable in cases of nervous inflammatory affections of the respiratory system, but may be sought by those of asthenic, leuco-phlegmatic habit of body.

CADIZ—is peculiarly situated on the shores of the Atlantic, being of peninsular form, and connected with the mainland by means of a low, narrow isthmus, which contributes to the formation of an extensive bay. The geographical position of the town is, Lat. 36° 31′ 41″ N., Long. 6° 17′ 13″ W.

The climate of Cadiz is of a soft and humid character, and, in its influence upon the constitution, is sedative and relaxing. Hence it may be recommended in certain cases of inflammatory affections, whether of the respiratory or of the gastric apparatus; but with persons of an asthenic, leuco-phlegmatic type it must necessarily disagree. The mean annual temperature of Cadiz is 62°, that of winter being 52·80, of spring, 60·28, and of summer, 70·20. The winds are variable, but those from the sea predominate over the land winds in a ratio of 2 to 1. Rain falls on an average, on one hundred days during the year, the quantity being about twenty-three inches, most of which is precipitated during the seasons of autumn and winter.

Having put the reader in possession of the leading characteristics of the climate of Cadiz, I leave him to strike a balance between the following statements by two well-known authorities. Dr Francis says :—"To sum up; the winters partake the general character of the other seasons in regard to the existence of a moist, temperate, and somewhat sedative atmosphere, broken, however, by occasional accessions of north wind, which are usually dry and stimulating. For steadiness the preference must be given to Malaga; but although the changes are sudden and frequent,

the range is small, and the almost insular situation ensures a comparative mildness of the nights. There will seldom be a day in which a considerable degree of warmth will not be experienced out of doors in sheltered places. Fires will be necessary when the land winds blow, but during the prevalence of the soft sea-breezes, artificial heat will be generally unbearable, even in the month of January. Once or twice during the last twenty years, thin films of ice have been seen at early morning upon puddles exposed to the north, but no snow has fallen since 1819. These occurrences, therefore, are so unusual as hardly to claim consideration in our estimate of the climate. But in order to derive advantage from the mildness of the winters of Cadiz it is necessary, in a peculiar degree, to be careful in the choice of a situation for residence. A disregard of this precaution has explained nearly all the cases of disappointment with the sanative properties of the climate, of which I have heard; and is of itself sufficient to make all the difference beween success and failure in regard to the object for which an invalid may go to Cadiz."

Mr Ford, in his *Hand-Book*, says:—"Cadiz, purely a commercial town, has little fine art: *les lettres de change y sont les belles lettres.* It has small attraction to the scholar or man of pleasure; it is scarcely even the *jocosa Gades* of the past; for poverty has damped the gaiety, and the society being mercantile, has always been considered by Spaniards as second rate . . . . Cadiz, as a residence, is but a sea-prison; the water is bad, and the climate, during the *Solano* (its sirocco wind), detestable; then the mercury in the barometer rises six or seven degrees, and the natives are driven almost mad, especially the women; the searching blast finds out everything that is wrong in the constitution."

MADRID—the capital of Spain, is situated near the centre

of the kingdom. It lies upon the left bank of the *Manzanares*, in the middle of the table-land of Castile, at an elevation of 1995 feet above the level of the sea, in Lat. 40° 24′ 57″ north, and Long. 3° 41′ 51″ west.

From its lofty and exposed situation, the city is subject to remarkable vicissitudes of temperature, the diurnal and annual range of the thermometer being very wide. During the summer of 1839, which Dr Francis spent in Madrid, "the thermometer on three occasions marked 112° in the shade, whilst in the succeeding winter there were several days of skating." The diurnal range of temperature is likewise very great, an inhabitant of Madrid, according to Thierry, being usually exposed to a difference of nearly forty degrees. The seasons are uncertain, and frequently seem to consist of a sudden change from heat to cold, and contrariwise. Summer is excessively hot, and in August the temperature is almost unbearable. Spring is always a fitful and unhealthy season, the greater part of autumn and the beginning of winter being the only agreeable period of the year. Very little rain falls in Madrid, and that only on about forty days annually.

The climate of Madrid is very unhealthy, and its inhabitants are short-lived. It is of a dry, irritating, stimulant class, and is altogether unfit for invalids generally. All inflammatory affections of the respiratory organs are common there. Children's diseases are always prevalent, and frequently fatal; inflammatory fevers and rheumatism are of constant occurrence; but there are two diseases which are especially rife, colic and pneumonia, the former of which, although not usually fatal, is often so protracted as to compel the sufferer to retreat from the city to a lower level, whilst the latter not unfrequently terminates the existence of those attacked by it in a few hours.

The air of Madrid, says Ford, employing the words of an old proverb, in his too brief account of the climate, "which will not extinguish a candle, puts out a man's life. Dry, searching, desiccating, and cutting, this assassin breath of death pierces through flesh and bone to the marrow; hence the careful way in which the natives cover their mouths, the women with handkerchiefs, the men by muffling themselves up in their cloaks, *embozandose en las capas.* The average of death at Madrid is as 1 in 28, while in London it is as 1 in 42: no wonder, according to Salas, that even the healthy of those born there live on physic."

MALAGA—is situated on a bay of the Mediterranean, sixty-five miles east-north-east from Gibraltar, in Lat. 36° 43′ 5″ N., and Long. 4° 26′ E. It is constructed in the form of an amphitheatre, and is commanded by an old castle of Moorish architecture, which rests upon a rock called the *Gibralfaro.*

The town is built upon a fertile tract of land, receding from the sea towards a mountain range which forms a protecting background at a distance of about four or five miles to the north. These mountains, having an elevation of very nearly 3000 feet, form a somewhat semicircular barrier around the town, and are especially protective on the north and west sides. They are clad with vines to their very summits. Beyond this range is one still higher, the two being separated by deep valleys. Thus the town is protected in a great measure from the cold winds of winter, which after sweeping over the summits of the loftier mountain chain fail to pass the second barrier. From the inner range an offshoot of gentle vine-clad hills is directed towards the shore, forming a partial protection to the town on the east side. The mountains towards the west whilst

they pursue a continuous route and afford shelter from the wind, are nevertheless at a sufficient distance to prevent their intercepting the solar beams during the later periods of the day. In one part of the mountain-barrier, towards the north-west, there is a marked depression giving passage to the river *Guadalhorce*, by means of which certain obnoxious winds find access to the town.

Malaga has a south-eastern aspect, contains a population of over 100,000 people, and is divided into what is termed an old and a new town. The former consists of narrow and dirty streets flanked by lofty houses; it is built on an acclivity which stretches towards the old Moorish castle that overhangs the town on the east side. The new town occupies a site formerly swept over by the sea, which appears to be gradually receding. This division of Malaga is constructed upon level ground of sandy formation. It is intersected by the chief promenade—the *Alameda*—a sort of wide *boulevard*, planted with trees and otherwise rendered attractive by means of fountains and statues. With the exception of the road to the Mole, this is the only really protected walk for invalids, and besides these two none are adorned with trees; but in the neighbourhood there is abundance of accommodation for walking and driving in a pleasant and comparatively open country.

Either in the Alameda or on the *quay* the invalid will meet with the best winter quarters, taking care to procure apartments possessed of a southerly aspect. In the short streets leading from the Alameda to the sea are also eligible houses. The great complaints against the habitations available for invalids at Malaga are, their inefficient protection from heat and cold, and the absence of open grates or stoves. It is said that, in rooms with a southerly aspect, artificial warmth is never required; but whatever may be the steadi-

ness of the temperature as indicated by the thermometer, there are always sensible changes which affect the invalid, especially those so perceptible on dull days.

As a commercial town, Malaga ranks scarcely below Barcelona and Cadiz; but it affords hardly any object worthy the attention of connoisseurs in arts or literature, however interesting it may be to men of business habits.

The climate of Malaga is remarkable for its mildness and equability, for the genial character of its winter and spring seasons, and for its general dryness. It may be considered as the one upon which the reputation of Spain as a valetudinarian resort chiefly hangs. I have discovered but little difference of opinion amongst those who have had experience of its sanative influence; the prevailing idea being, that it is equal in its efficacy in the alleviation of bodily sufferings to the climate of any other part of Europe. There are exceptional years at Malaga, as everywhere; and I have heard many invalids complain of occasional discomforts attending untoward meteorological vicissitudes—and, to give one instance, I met a gentleman in Algiers who had been "driven from Malaga by the dust"—but the general feeling appears to be decidedly in favour of it.

Two authorities, already mentioned, when treating of other Spanish towns, who are not always accordant in their opinions upon the climate of these places, are agreed concerning that of Malaga. "Invalids," Mr Ford says, "and especially those whose lungs are affected, will find the climate of Malaga superior to anything in Italy or Spain. Winter is quite unknown; open to the south and sea, the city is sheltered from the north and east by the mountains." Dr Francis says, "There is no place in Spain, nor in the whole of Europe, so far as our present information goes, that possesses a climate at once so mild and equable, with

so little variation from day to day, and from day to night, as Malaga. . . . Winter can hardly be said to exist; a perpetual spring, during which vegetation proceeds unchecked, connecting the autumn of one year with the summer of the next. The natives, fully alive to the delicious character of their climate, spend a large portion of their lives and seek their amusements in the open air; whilst many of the poor, the whole year through, care for no other bed than such as they can spread after nightfall upon the public walks.

Although a warm climate, Malaga is not so relaxing as it would be were humidity a concomitant element in its composition, nor, on the other hand, does its dryness stimulate the system in a manner similar to that of Nice, for example. It is *gently* stimulant and tonic, but not bracing; whilst the steadiness and elevation of its winter and spring temperature cause it to impart a decidedly soothing effect upon the nervous system, and especially upon the respiratory and digestive apparatus.

The mean annual, seasonal, and mensual temperature of Malaga, from observations made by Dr Shortliff, who has lived there for many years, is as follows:—Annual, 66·07. Winter, 56·03; spring, 62·35; summer, 76·82; autumn, 69·06. January, 55·43; February, 56·03; March, 59·06; April, 62·20; May, 65·80; June, 74·73; July, 77·73; August, 78·02; September, 74·70; October, 70·57; November, 61·93; December, 56·63. The mean annual range of temperature is 49°. The mean temperature of the months, as observed at three different periods of the day, 8 A.M., 2 P.M., and 11 P.M. respectively, is as follows:—January, 54·2, 58·6, 53·5; February, 55·9, 57·1, 55·1; March, 57·5, 60·9, 58·8; April, 60·9, 64·5, 61·2; May, 65·2, 67·6, 64·6; June, 73·1, 76·6, 74·1; July, 76·5, 79·6, 77·1; August, 77·1, 79·9,

77·2 ; September, 73·3, 76·9, 73·9 ; October, 68·3, 71·6, 71·8; November, 60·7, 64·9, 60·2 ; December, 55·0, 59·1, 55·8.

It will be observed, that the mean daily range of temperature, as well as the mean difference between the successive months, is low. It is this steadiness of the thermometer during the day, from day to day, and from day to night, that constitutes one of the most important of the features in the climate of Malaga. The barometer shows the same equable condition of the atmosphere in point of pressure. Snow and ice are rarities, at least as the result of natural phenomena observable in Malaga itself.

The mean annual fall of rain is said to be only 16½ inches, and the approximate number of rainy days about 40. The greater part of the rain falls in May, and the rest during autumn and winter. July and August are almost invariably dry months. But in spite of the lack of rain the atmosphere is not wanting in moisture, as is shown by its condensation into the form of a heavy fog, whenever the temperature falls rather more than usual immediately after sunset.

Southerly winds fall upon Malaga without impediment; they are sea-breezes, and vary in their peculiarities according to their relation with the other cardinal points. The south-west wind arrives from the neighbourhood of Gibraltar; in winter it is cold, loaded with moisture, and frequently the harbinger of storms, when it is known as the *Vendebal;* in summer it is usually a light sea-breeze, the *Leveche,* as it is called. The direct south wind (the sirocco) retains some of its African characteristics, modified, however, by its passage across the Mediterranean. The south-east and east winds cross the sea, and are more or less humid; they cool the summer atmosphere, and produce an unpleasant chilliness in winter. The west wind is a dry

one, comparatively warm in summer and cold in winter. Winds from the direction of the sea predominate in spring and summer, whereas those from the land side prevail in winter; but from the latter the town is in a great measure protected. The north-west (Terral) is the most baneful of these winds; it reaches the town through the breach in the mountain chain, previously mentioned, which gives passage to the river. This wind, like the mistral, is hot and dry in summer, cold and dry in winter. It is particularly hurtful to invalids, and is said to be the cause of a marked increase of criminal offences, so that malefactors whose misdeeds were committed during its prevalence are always dealt with in a lenient manner.

The inhabitants of Malaga are considered healthy and long-lived. In a report by the late lamented British Consul, W. Mark, Esq. (whose son succeeded to the post, and is highly respected), in 1829, the following passage occurs:— "The salubrity of Malaga is surprising, and scarcely credible. The population is dense, there is a great deal of misery; the prisons are crowded, and with a depôt of convicts (about six thousand), a badly conducted police, the wonder must be that it is not a sink of pestilence. Instead of that, it is, under all these and other circumstances equally unfavourable, the healthiest place perhaps in the world. I speak from thirteen years' experience. Sometimes two and three days pass without a single death throughout the city." And he further states: "Ten died last year (1828), in preceding years from six to eight) of 100, 102, and 105 years, and many others from 95 to 100. Persons of from 80 to 90 years of age may be seen going about the streets with the full use of all their faculties."

From opportunities afforded to Mr Lee for examining the register of the hospital at Malaga, he learned that

during nine years, from 1840 to 1849, the proportionate number of deaths from different diseases was as follows:— Gastro-ataxic and typhoid fevers, 90; apoplexy and chronic cerebral affections, 64; acute pulmonary affections, 66; chronic pulmonary, 190; phthisis, 239; chronic affections of the digestive organs, 332; dysentery, 87; dropsy, 259; wounds, 142. Phthisis and chronic diseases of the respiratory organs constitute about a ninth part of the whole mortality in the town and hospital. The greatest amount of sickness prevails in December and January, the least in April and May."

As to the class of cases in which it would be proper to recommend the climate of Malaga, I need not say much. It is to be remembered that it is what might be called an *intermediate* climate, between those termed bracing on the one hand, and those known as relaxing on the other. Therefore, in incipient phthisis, in bronchitis, laryngitis, asthma, dyspepsia, gout, rheumatism, scrofula, or in any other disease requiring for its proper treatment a residence in a mild and equable climate, but in which there is, from some particular circumstance, an intolerence either of a thoroughly humid or of an essentially dry climate, Malaga may be recommended. It may be reached either direct by sea from England, or by land from the south of France.

The climate of Torre Molinos, a village about seven miles to the south-south-west of Malaga, is rather of a bracing character than otherwise. Summer residences may be had at Alhaurin and Ronda; but invalids would do well, generally speaking, to remove farther north during that season. The Pyrenees afford opportunities for supplementing the effects of a winter in a mild climate by a course of mineral waters, if such treatment be deemed judicious. The thermo-

sulphur springs of Carratraca, scarcely available for invalids requiring much attention and comfortable accomdation, may be visited on the road to Ronda.

LISBON

The capital of Portugal lies upon the right bank of the Tagus, near its embouchure into the Atlantic Ocean, Lat. 38° 42′ 4″ N., Long. 9° 8′ 2″ W. The city is built in amphitheatrical form upon hills of inconsiderable elevation, which are intersected by valleys giving passage to a variety of winds. When these winds are vehement, not an unfrequent occurrence, they search through the valleys and penetrate the houses exposed to their course, to the injury of all persons of delicate constitution, more especially where the respiratory organs are implicated. Houses exposed to the north and north-east are most affected by these prejudicial winds. It is a common occurrence to pass from one street where there is no wind at all to another in which a cold, penetrating blast is sweeping along, to the great discomfort of those walking about. This hurtful circumstance is aggravated if the person exposed to it come in contact with it immediately after leaving an atmosphere of elevated temperature, as that of a ball or concert room. Coughs, colds, bronchitis, and pulmonary consumption frequently arise out of these untoward vicissitudes of temperature.

Phthisis is common in Lisbon; it attacks persons of all ages, but especially those between twenty and thirty-five. Sometimes it sweeps away entire families. Although statistics are not well determined respecting the ratio of deaths by this malady, yet in the Hospital of St José one-tenth of the whole number of deaths is caused by it. This

is not high when compared with many other countries, nevertheless it is worthy of consideration when regarding the climate in a sanative point of view. Scrofula, inflammation of the lungs, pleurisy, bronchitis, laryngitis, tubercular meningitis, tabes-mesenterica, and rachitis—not to mention the loathsome leprosy of the country—are also diseases of common occurrence in Lisbon.

The most common cause of many of the above-mentioned inflammatory attacks is the sudden change of temperature so frequently encountered on leaving the warm rooms of a house, and especially those of houses of entertainment, for the open air. This gives rise to the antecedent catarrh and bronchitis which so often end in a tendency to tubercular exudation. Other circumstances combine, however, to predispose the constitution for the reception of any of the above disorders; insufficient diet, imperfect ventilation, want of proper physical exercise, mental depression, and immorality, the evil effects of all overgrown cities, being the most common.

Phthisis usually assumes the chronic form in Lisbon, a circumstance favourable to the opinion that secondary causes have greatly to do with its origin; but it occasionally cuts life short in a period varying from two to three months from the first appearance of any physical symptoms. As a winter resort, then, Lisbon cannot be recommended in cases of pulmonary consumption, nor even in cases of a premonishing type. The climate is too keen and unsettled for such invalids.

Healthy people may not experience any inconvenience from the diurnal and annual range of temperature observable in Lisbon. The cold of winter is never very severe, nor is the heat of summer at any time insufferable; the soft and moist westerly and south-westerly, and the dry and cold

winds from the north, exercising almost always a modifying influence during certain hours of the day; but the valetudinarian is exceedingly sensitive to variations of temperature.

The mean annual temperature of Lisbon is stated by several authorities at the following figures:—Dove, 61·40; Daniell, 62·00; Humboldt, 61·70; Franzini, 61·00; Pretorio, 63·50. The mean temperature of the seasons and months, according to Dove, is as follows:—Winter, 52·52; spring, 59·66; summer, 70·94; autumn, 62·48. January, 52·52; February, 53·60; March, 56·30; April, 59·00; May, 63·68; June, 69·44; July, 72·14; August, 71·24; September, 69·44; October, 62·60; November, 55·40; December, 51·44. The difference between the hottest and the coldest month of the year is 20·70.

According to Franzini's observations, the lowest temperature of the winter quarter during sixteen years was 26·00, the highest 68·00, showing a difference of 42 degrees. During the same number of years frost occurred (for two or three nights at a time) six times in December, eight times in January, and, in one winter only, on two nights in February. Sometimes, when the presence of frost indicated that the temperature had been at least as low as 32° during the night, the thermometer showed from 59° even to 67° of heat during the hottest part of the day. In like manner Franzini's observations yield the following figures as the mean extreme range of temperature for the remaining months of the year:—March, 34·33; April, 38·33; May, 44·33; June, 39·00; July, 46·50; August, 41·00; September, 40·33; October, 37·66; November, 36·66. The diurnal range of temperature varies greatly; sometimes it is not more than 5° or 6°, whilst at others a difference of 20° or even 30° is not an uncommon occurrence. The

change of temperature, at a fixed hour from day to day, is less remarkable than that observed in any one given day, unless there be a change of wind between the times of observation, when it may be as much as 10° or 15°.

The north-east and due north winds are generally the coldest; the south wind is either hot or temperate according to the time of year, and that from the west has usually an agreeable freshness. The north-east wind has a deleterious effect upon delicate persons in winter; it is invariably accompanied by a temperature but little above the freezing point, and it gives rise to inflammatory affections of the respiratory organs. To pass from the sunshine into the shade during the prevalence of and whilst exposed to this wind, is inevitably to produce catarrh, if not something worse.

Although the climate of Lisbon is of a dry and stimulating character, it is not without a fair share of rain. The greatest quantity falls in winter, less in spring and autumn, and rarely any at all in summer. According to Mr Barral's statement, there are about 98 rainy days in the year, of which 35 occur in winter, 26 in spring, 8 in summer, and 29 in autumn. The annual amount of rain is about 23 inches. There are a few exceptional days in winter, when the atmosphere is loaded with moisture; but generally it is rather dry than humid, and especially in summer, as indicated by the withered appearance of the neighbouring country.

M. Barral gives the following summary of the seasons: The predominating winds are those from north-east to south-east, and the mean annual number of days during which the winds blow violently is 83; there are many days on which it blows more gently, but entirely calm days are rare. Rain usually accompanies winds from the south-

west to the north-west, showers with the latter, storms with the former. The intense cold of winter is brought by the north and north-east winds. In winter, it is common to see the barometer descend some millimetres, and four-and-twenty hours or more afterwards, to observe the wind chop round from north-west to south, followed by rain, the temperature remaining mild for many days. Then the barometer rises, the wind shifts to the north or north-east, and the weather becomes fine and clear, with a low temperature, and remains in this condition for several days.

Spring is very irregular, not only as to its temperature, but relatively to the winds and rains, and to the weather in general. There are days of great heat followed by evenings and nights so cold as to require additional clothing. Rainy days follow fine and cloudless ones. In occasional years, a sudden depression of temperature occurs in April or May, requiring the use of winter clothing, which the previous fine weather had permitted the people to dispense with.

In summer the winds are more regular, those from the north, frequently violent, predominating. It is common to observe the day commence serene and hot, and to continue thus until between two and three in the afternoon, when a refreshing sea-breeze sets in, which subsequently veers round to the north. This play of the winds purifies the atmosphere, and is of great benefit. The north-east wind blows vehemently during the months of July and August, alternating with moderate sea-breezes.

In autumn anemological irregularities are at a minimum, and the rainfall being moderate, the season is a very enjoyable one in Lisbon and its neighbourhood. Considerable heat is still occasionally manifested in September, and vicissitudes of temperature are sometimes very marked;

but the latter half of that and the entire of the two succeeding months constitute the most agreeable season of the year. There are exceptional years, however, in which the various seasons are more or less modified.

There are circumstances connected with the sanitary regulations of the city which it would be proper to mention were Lisbon likely to be selected as a winter resort, which it is scarcely calculated to become, since other far more desirable localities have been opened up, and rendered easy of access. It is sufficient to say of them that, although of late years much improved, they are still far from being conducted in accordance with acknowledged laws for public health.

Invalids afflicted with disorders of the respiratory apparatus not unfrequently leave Lisbon in spring for situations in the country, at distances varying from one to two leagues from the sea. Here they find localities free from the noisome effects of inefficient sanitary regulation, slightly elevated, protected from the winds, and offering suitable accommodation for out-door exercise. Of such places, Campolide, Sete-Rios, Convalescença, Bemfica, Calhariz, Larangeiras, Palma, Campo-Grande and Lumiar are so many, where invalids usually remain for four or six months. They generally return to Lisbon towards the end of autumn, when both the cold and humidity are greater in the country than in the city. The habitations at these places are generally badly constructed, at least such as are to be hired; others in the occupation of the proprietors are of a better class. The country in the immediate neighbourhood of Lisbon is but little wooded, and has a dry and withered aspect. In summer the temperature is usually high, the atmosphere dry, and the promenades are exposed to the winds, to the unmitigated rays of the sun, and to clouds of dust.

The climate of Lisbon, then, is dry, stimulative, and tonic; but it is fitful and unsafe for persons threatened with inflammatory affections of the respiratory organs. Although the mean temperature of the seasons and months is moderate throughout the year, yet the sudden changes to which it is liable at every shift of wind stamps it with the word *dangerous*. In diseases of an atonic character, occurring in persons but little liable to intercurrent attacks of inflammation, and especially if other circumstances besides those pertaining to health prompt the patient to select it, Lisbon may with precaution be recommended.

CINTRA—is situated on the acclivity of the mountain-chain of the same name, fourteen miles west-north-west from Lisbon. It is the summer residence of the royal family of Portugal, and is visited by the first families of the metropolis. The scenery around Cintra is a mixture of rocky heights and wooded dells, diversified by numerous parks and gardens, forming a summer retreat at once unique and attractive. The nature and profuseness of the vegetation, the numerous lively streams, together with the refreshing breezes, render it an enjoyable and safe residence during the hot months, alike for the healthy and the sick. Cintra is not available to invalids in winter, its climate being then *foggy, raw, and dull.*

GIBRALTAR.

This isolated portion of the British possessions occupies the mountainous promontory at the entrance to the Mediterranean, in Lat. 36° 7′ 3″ N., and Long. 5° 21′ 2″ W. The town is built on the western aspect of the rock. I need not dwell upon the picturesqueness of its situation, upon the accommodation which it affords, nor upon the peculiar

privileges with which its proximity to, and constant communication with, this country invests it. As a winter residence for invalids, its mild temperature is scarcely sufficient to counterbalance the want of many other essentials for such a reputation. Phthisical patients should not be sent there; but in the case of a person requiring active travelling with constant change of scenery, Gibraltar may be recommended for a brief sojourn.

The soil covering the rock presents considerable diversity in different parts of the promontory; near the town it is composed chiefly of red sand; on the east side the sand-bank is of a whitish-grey colour; in the south it is variegated, composed in some places of a light and very fertile mould, which, after falls of rain, is converted into a slimy consistence; whilst in other situations a stiff marl predominates.

There are no mineral springs in Gibraltar, but at a distance of two miles from the garrison there are two which yield slightly chalybeate waters. The baths of Hedionda, in the district of Casares, are about twenty-two miles north of Gibraltar. Their temperature is about 73·60; they are strongly impregnated with sulphur, in so much that the peasants make matches by simply dipping strips of linen in the stream; besides this, they contain small quantities of chloride of calcium, sulphate of magnesia, sulphate of lime, and earthy (siliceous) matter. Near the springs the natives have constructed baths and habitations, to which they resort for the cure of cutaneous affections, chronic rheumatism, obstinate ulcers, disorders of the genito-urinary system in both sexes, &c.

According to Dove, the following figures represent the mean annual, seasonal, and mensual temperature. Annual, 67·44; winter, 57·93; spring, 66·25; summer, 77·82; autumn,

67·76; January, 58·00; February, 57·63; March, 63·21; April, 66·00; May, 69·55; June, 75·13; July, 79·46; August, 78·88; September, 73·83; October, 67·38; November, 62·08; December, 58·17.

The hottest months are June, July, August, and September; and the coldest, December, January, and February. The difference of temperature between the hottest and coldest month is 21·83; between summer and winter, 19·89.

Snow seldom falls at Gibraltar, and ice is rarely met with thicker than a mere pellicle. Hail storms are not uncommon and are generally accompanied by thunder, lightning, and other meteoric phenomena. Gibraltar is greatly affected by changes of wind, which, together with the rain, are more to be feared by visitors to the Rock than the ordinary daily range of temperature. The mean number of rainy days in each month, on an average of ten years, is as follows:—January, 9·10; February, 7·10; March, 6·20; April, 10·10; May, 6·10; June, 1·80; July, 0·4; August, 0·9; September, 2·90; October, 5·70; November, 9·50; December, 8·80; giving a mean annual total of 68·60. Although April has the highest number of rainy days, the heaviest fall of rain usually occurs in January.

Of the winds, the south-west is the rainy one; it is mild and soft. The south-east wind—the dreaded Levante—blows bleakly upon Gibraltar; it is a cold, raw, humid wind, and usually gives rise to a dense wet fog which rolls in thick clouds over the rock. Easterly winds prevail in July, August, and September; westerly ones in December, January, and May. It has been noticed that in the course of half-a-dozen years, there are 222 days more of easterly than of westerly winds.

The sanitary regulations of Gibraltar are very defective,

especially the sewerage and drainage, which have been so greatly neglected as to be a probable cause of much of the sickness occurring there.

IONIAN ISLANDS.

This group of islands is situated in the Mediterranean, off the west coast of Greece and Epirus, between Lat. 35° 55′ and 39° 55′ N., and Long. 19° 20′ and 23° 15′ E. It consists, besides many smaller, of the following islands: —Corfu, Cephalonia, Zante, Santa Maura, Ithaca, Paxo, Cerigo, Fano, Merlera, Meganisi, Kalamo, Servi, and Cerigotto. The surface of these islands generally is mountainous and rugged, but there are, in the larger, plains well cultivated and fertile. I have not space sufficient to enable me to enlarge upon the topography of these numerous islands, and therefore I must confine my remarks entirely to the consideration of their climate.

Beyond a few slight peculiarities, attributable to local circumstances, in each island, the climate of the whole group is tolerably uniform. The accession of the various seasons is well marked and generally regular. The weather in winter is usually stormy, and characterised moreover by the increased fall of rain; northerly winds for the most part prevail during that season. Spring is ushered in by southerly winds about the middle or end of March; it is much milder than the preceding season, and rapidly gives life to the vegetable world, the foliage being remarkably sudden in its growth under the influence of refreshing showers. Summer supervenes in May, bringing with it both heat and dryness. A series of thunder storms and heavy showers usually attend the close of summer and introduce the agreeable season of autumn, or "Little

Summer" as it is sometimes called, which is likewise frequently brought to a close by tempestuous weather, followed by cold northerly winds and a sprinkling of snow upon the mountains.

The mean annual temperature of Corfu, on an average of the years 1821 to 1827 inclusive, from observations by Dr Roe, by means of a thermometer kept in a well ventilated room without a fire, is 65·24; that of Santa Maura, from observations made by Major Temple (1820–23 inclusive), by means of a thermometer kept in an open verandah, is 65·48; that of Zante, from observations by Captain Cranfield (1822-25 inclusive), being 66·5.

The mean temperature for the seasons and months for the year 1823, as deduced from the same observations, is as follows:—Winter, (Corfu) 53·00; (Santa Maura) 53·16; (Zante) 57·50; spring, 61·00; 63·33; 65·16; summer, 78·00; 78·66; 79·16; autumn, 71·66; . . . 68·50. January, 52·00; 51·50; 55·00; February, 53·00; 55·00; 59·50; March, 56·00; 57·50; 59·50; April, 59·00; 62·00; 64·00; May, 68·00; 70·50; 72·00; June, 75·00; 77·00; 77·00; July, 79·00; 79·00; 79·50; August, 80·00; 81·00; 81·00; September, 79·00; 74·00; 75·50; October, 73·00; 70·00; 70·00; November, 63·00; . . . 60·00; December, 54·00; . . . 58·00. As the instruments in taking these observations were not fully exposed, the figures will probably be rather higher than the actual temperature of the atmosphere in an unprotected condition.

Rain falls more or less in nearly every month of the year, but November, December, February, and March, are the most rainy. From a table constructed by Dr Davy, it appears that the number of rainy days in each month, from an average of three years (1823–25), at Corfu, Santa Maura, and Zante, is as follows:—January, (Corfu) 11·6; (Santa

Maura) 15·6; (Zante) 13·3; February, 11·3; 6·3; 6·3; March, 13·0; 10·6; 11·6; April, 13·6; 7·0; 4·0; May, 4·0; 2·0; 0·6; June, 5·0; 3·0; 1·6; July, 3·3; 0·6; 1·0; August, 0·6; 0·6; 0·6; September, 6·6; 6·6; 5·6; October, 10·3; 5·6; 5·3; November, 10·6; 7·0; 9·6; December, 13·3; 6·2; 8·0. During heavy falls of rain, not unfrequently accompanied by storms of thunder and lightning, especially about the beginning of autumn and winter, the temperature of the atmosphere is greatly reduced. The barometer is subject to wide ranges during all the seasons, except summer, and when the weather is unsettled the oscillations of the mercury are pretty nearly the same as in this country.

The atmosphere of the Ionian Islands is for the most part moderately moist, except in summer, when it is occasionally very dry. This condition of the air depends greatly upon the direction and force of the wind.

In autumn and winter the most frequent winds at Corfu are those from the E., ESE., S., and SE. The summer winds are the N., NNE., NE., and ENE. The land winds from the north are usually very dry and hot in summer, and are opposed to the southerly winds (especially the sirocco, SE.) which are always humid. Of the different influences exercised by these two classes of winds upon the constitution, Dr Davy says:—"The contrast between the hot, dry, northerly winds, and the warm, moist southerly, in relation to sensation, is very remarkable. The former are infinitely less oppressive than the latter, when the moist thermometer falls from 25° to 30°, though the temperature is above 90°,—though everything metallic feels hot, and the furniture and wooden-work of one's room may be cracking with explosive violence,—yet the sensation of heat is not disagreeable, the skin is dry, and exercise may be taken in the open air with

pleasure and alacrity, and with little feeling of fatigue. With a sirocco wind at 85°, one is bathed in perspiration,—one feels as in a vapour bath,—and life is almost a burden." A change from a southerly wind, with the atmosphere loaded with foggy moisture, to a northerly one, is followed by a rapid clearing of the air until it assumes a brilliant transparency. The deposition of dew is most abundant in autumn; it is seldom observable during summer, and in winter and spring it varies considerably according to the clearness of the sky.

Snow is of comparatively rare occurrence, but occasionally the summits of St Salvador is thinly covered for several days at a time. Snow generally begins to fall upon the Albanian Mountains towards the end of November, and abides there until the following May. Mount Ænos, or the Black Mountain, as it is now usually denominated, in Cephalonia, is the loftiest summit of the Ionian Islands (5259 feet); its peak is covered with snow every winter. The condition of the neighbouring mountains with respect to snow partly gives character to the northerly winds, which, although at all times dry, may be cold or hot according to the state of the country over which they travel; in winter, therefore, they are *cold*, in summer *hot*, and dry.

In summer the mountainous parts of the islands afford residences preferable to those on the shores, there being frequently a difference of from 12° to 15° in the temperature of the atmosphere between the two. The villages of Peritia and Seignes, on the slopes of Saint Salvatore, in Corfu; of Vathkirri and Englavi, in Santa Maura; and of Maries, in the mountain range of Zante, are all most agreeable summer retreats. Speaking of such villages, Dr Davy (who has had great experience of Mediterranean climates, and whose works on the Ionian Islands, especially,

affords most agreeable and instructive reading) remarks: "All of them are easily accessible, and may be reached in a few hours from the principal stations of the respective islands. The air in all of them is salubrious as well as cool; and what is hardly less important in relation to comfort, the water is also cool. Moreover, the scenery in their neighbourhood, without exception, is of an interesting character—the views, especially the distant ones, magnificent; and, in consequence, there is much inducement to take exercise (an important circumstance in relation to health), and, in doing so, great and varied enjoyment. When I visited Vathkirri and Englavi, in the middle of March 1825, the temperature of a spring in the latter village was 54°, and of a very copious one, sufficiently large to turn a mill, in the vicinity of the former, 54·5. Then the adjoining mountains were covered with snow, in which, in some places, we sank knee-deep; and the wild and alpine character of the scenery was heightened by tracks of wolves in the snow. These villages are so cool that the oak flourishes there, not the olive. In the beginning of April, when I was at Peritia and Seignes, the temperature of the springs in both was only 50°. The inhabitants are familiar with frost and snow—a winter does not pass without them; indeed, their complexions were indicative of the climate; they had more of the fresh colour of a northern than the olive hue of the southern races."

Of the diseases met with in the Ionian Islands, intermittent and remittent fevers are perhaps the most common, malaria being the bane of the inhabitants. Dysentery and diarrhœa are also common. Pulmonary consumption and inflammations of the lungs are said to constitute a proportion of one to two and a half to all the other fatal complaints. The plague has on several occasions visited these

islands. The inhabitants, however, frequently attain a great age.

As a resort for invalids, the Ionian Islands are most inviting to that class who can bear vicissitudes of weather, and require but little inducement to draw them into the open air. In winter, although the temperature is moderately uniform, the changes of weather, and the almost constant humidity and frequent fogginess of the atmosphere, unfit these islands as a residence for consumptive invalids. In some varieties of bronchial affections, in the absence of profuse secretion, of dyspepsia, and in many disorders, the result of a too close application to business or study, the Ionian Islands may be visited either with a view of a prolonged sojourn, or as part of a tour from place to place.

MALTA.

This small island is situated in the Mediterranean, at a distance of sixty-two miles south-south-west from Sicily, its chief town (Valetta) being in Lat. 35° 53′ 8″ N., and Long. 14° 31′ 2″ E. The island is of an irregular oval shape, seventeen miles long and eight broad. Its scanty soil, which overlies the calcareous rock to a depth of scarcely more than eight to ten inches, is assiduously cultivated, and yields an abundant return for the labour bestowed upon it. The surface is generally of an undulating character, its loftiest elevations not exceeding 550 feet. The coast line is broken by numerous bays.

The island of Gozo, north-west of Malta, is nine miles long and four and a half broad. Its surface presents a deeper, better cultivated, and comparatively more productive soil than its neighbour.

Valetta, the capital of Malta, is constructed upon a ridge

of rock, which projects northward, separating the Grand Harbour from that (Marsa-Musceit Haven) in which quarantine is performed. The central portion of this promontory is the loftiest, whence it slopes somewhat abruptly to the water on both sides. Eight of the principal streets run in a parallel direction (south-south-west to north-north-east) along the spine of the promontory, whilst others cross them at right angles, and lead towards the two harbours. Valetta is a clean, well built, and orderly garrison town, its peculiar position rendering the administration of sanitary laws a matter of no great difficulty. It is supplied with water by means of the aqueduct of Vignacourt, which conducts it in great abundance from the interior of the island. One of the most picturesque appearances it was ever my lot to witness occurred whilst approaching and entering the Grand Harbour of Malta at midnight under the unmitigated brilliancy of a spring moon.

The climate of Malta, although possessing some features in common with that of the Ionian Islands, is nevertheless considerably modified by its physical construction and relations. Being nearer the equator, farther from the northerly mainland, nearer to the desert of Africa, and having no elevation exceeding 550 feet, Malta has necessarily a warmer temperature, and is less subject to vicissitudes of weather than the Ionian Islands.

The temperature of Valetta throughout the year is more uniform than that of the interior of the island; for this reason, that the massive buildings of the town have the effect of modifying the excessive heat of summer, whereas the bare unwooded surface of the island in other parts tends to increase the temperature by radiation. The mean maximum and minimum temperature of each month at Valetta, in the year 1833, as quoted by Dr Davy from

observations by General Elphinstone, are represented by the following figures:—January, (max.) 54·6 : (min.) 50·7; February, 57 : 52; March, 58 : 53; April, 61 : 56; May, 68 : 62·7; June, 73 : 73; July, 76 : 74·6; August, 77 : 76; September, 73 : 71; October, 70 : 66; November, 63 : 59; December, 60 : 55. During the same period, the greatest variation of temperature was, in January, 9°; February, 10°; March, 10°; April, 9°; May, 8°; June, 7°; July, 4°; August, 4°; September, 4°; October, 7°; November, 8°; December, 8°. The mean annual temperature of 1833 was 64°. During the three years 1832, '33, '34, the widest range of temperature in any month was 25°, of the whole period 46°, the highest indication of the thermometer having been 88 (in July 1834), and the lowest 42° (in January 1833). The mean maximum and minimum temperature, as observed by Dr Davy at the Inquisitor's Palace, about a mile from the nearest sea-cliff, and at an elevation of 550 feet, during the hottest months of 1834, were as follows:—June (max.) 74·5 : (min.) 65·5; July, 81·6 : 72·6; August, 82·3 : 73·00.

The prevailing winds at Malta are the south-east (*Sirocco*), south-west, north-east (*Gregale*), and north-west. Northerly winds are cool and refreshing when moderate; but when stormy, especially in winter, they frequently depress the temperature very suddenly. In summer they are cool, dry, and invigorating, when of sufficient force, but when light and variable they are commonly hot; in winter they are moist and unsettled. Gales of wind from the north-east—the "Gregale," as it is called by the natives—are frequently a cause of considerable damage in the harbour and town of Valetta. Southerly winds vary according as they proceed from an easterly or a westerly point. They are always warm.

The wind blowing from any point between south and south-west is characterised by heat and dryness above all others at Malta. In summer the temperature usually varies between 88° and 98° during their prevalence; but they seldom last longer than a few hours, and their disagreeable *heat* and *dryness* may be escaped from by carefully closing the windows and doors of apartments at their onset.

The sirocco is invariably a humid wind at Malta; it does not generally raise the temperature very high, even in summer. Dr Davy, during many years' observation never knew it raise the thermometer above 86°. It imparts a haziness to the atmosphere, the result of slightly condensed vapour, and carries along with it a certain amount of dust. In winter it is usually a mild and not disagreeable wind, having a temperature of perhaps about 60°, and even in spring and the beginning of summer, with a temperature of about 70°, it is scarcely considered unpleasant. But in the height of summer and in autumn, when it attains a temperature of 75° to 85°, it is greatly disliked by the inhabitants. The reader will find further information respecting the character and effects of this wind in Dr Davy's work on Malta, and likewise in Dr Hennen's "Medical Topography of the Mediterranean."

The atmosphere is seldom at rest in Malta, and never entirely calm throughout the day. The frequent gales of northerly winds during winter and spring render the climate often disagreeable and very trying for invalids. In summer, the continual breezes improve the condition of the atmosphere, which, I should mention, is remarkable for its excessive clearness and brightness through the greater portion of the year, and even more so during the night than by day, unless in rainy weather, when the reverse

obtains. The deposition of dew is neither so frequent nor so copious as, from the clearness of the sky and its calmness after sunset in the summer and autumn months, might be expected.

The annual rain-fall at Malta is considerable, although there are exceptional years of excessive and injurious drought. There is but little regularity observable in the times of its precipitation or in the quantity which falls at any one time. According to General Elphinstone's observations, there were in the several months of the year 1833 the following number of days in which rain fell:—January, 23; February, 10; March, 8; April, 6; May, 3; June, 5; July, 0; August, 0; September, 9; October, 11; November, 9; December, 6. Showers are far more common than continued rain, a really rainy day being almost unknown in the island. In autumn the showers are sometimes very heavy, and occasion great destruction. The mean maximum height of the barometer, in 1833, was 30·14, and the mean minimum, 29·58. Violent thunder storms not unfrequently occur in autumn and winter; they are invariably attended by heavy falls of rain, or of hail if the weather be cool.

The island of Gozo, being slightly more elevated than Malta, enjoys perhaps a somewhat cooler summer; and as Malta lies between it and the sirocco, that wind is a little improved in its condition, and in a slight degree less disagreeable in its effects upon the constitution, when it reaches Gozo. In all other respects the climate of the two islands is identical.

As a resort for invalids there are several objections to be urged against Malta, but there are other circumstances in its favour. Of the former, the fact of its being a garrison town, whilst it adds to the enjoyment of a few, is generally

offered by invalids as one of the chief. They, especially ladies, cannot exercise the same freedom in moving about in taking out-door exercise and in social intercourse in a densely populated town, where military barracks and ships of war abound, as they are able to do in a town possessed of environs which, if not sequestered, are at least not thronged.

In winter and spring the frequently tempestuous state of the weather, and the sensible vicissitudes of temperature arising from this circumstance, are likewise objectionable. And besides these, the lack of agreeable resorts in the interior of the island reduces the invalid to seek entertainment in the town of Valetta itself, rather than to make frequent excursions, either by walking or riding, which would contribute more largely to the general renovation of the system.

On the other hand, however, Malta has its advantages. The mean temperature of the seasons is moderate, the average range is not wide; and by exercising a little carefulness, the invalid may guard against the sudden changes of weather. Walking, riding, driving, or boating exercise, may be employed at discretion. Good accommodation may be obtained at moderate prices. Articles of diet are plentiful, good, and not dear. There is a constant bustle and activity in Valetta, which imparts a general cheerfulness to the mind. Meeting English people, using English money, the freedom from the discomforts of the Custom House, as well as the direct and frequent communication with England, are circumstances to be viewed with pleasure or regret, according to the taste of the traveller. The cases in which the climate of Malta might be recommended should be confined to those in which, whatever their nature may be, the disease is not far advanced, or in which the patient is susceptible of a rapid recovery. In pulmonary consumption,

unless at the very commencement of the disease, I believe the climate of Malta is not to be trusted. In advanced cases,—I mean in those only in which a change of climate is justifiable,—it ought certainly not to be recommended. No invalid should remain in Malta during the summer. Of chronic bronchitis it is difficult to say which variety would be best suited by a residence in Malta; sometimes the atmosphere is clear, dry, and keen, at others moist; one of which conditions, whatever might be the state of the patient, would disagree with him. In cases showing a general want of tone, with atonic dyspepsia, accompanied or not by depression of spirits, the liveliness of Valetta would most likely be beneficial; and for those who are suffering from a too close application to business or study, in which there is no local manifestation of disease, Malta might with safety be recommended. The months in which the climate is most enjoyable are those from October to January inclusive.

EGYPT.

The valley of the Nile possesses a climate of great uniformity, and on that account has for a long period been resorted to in winter by invalids whose condition forbids them to remain exposed to the capricious weather of their own country. *Dryness* is the characterizing feature of the climate of Middle and Upper Egypt; and to this may be added the pointed regularity of the changes which occur in the condition of the weather, and the state of the country from season to season. Of the seasons there are, indeed, but two: that which extends between October and March, and which may be named the temperate season—and the hot season, which continues from March to September. The

direction of the winds, the overflowing of the Nile, and other circumstances, to be mentioned hereafter, likewise punctually recur.

Egypt is situated between Lat. 23° 50′ and 31° 35′ N., and Long. 25° and 34° E., Cairo being in the same parallel as New Orleans, Basorah, Mooltan, and Ning-po, and in the meridian of St Petersburg, Odessa, Kutaya, and Port Natal.

From remote ages Egypt has been divided into three parts: 1. Lower Egypt, or *Bahari*, consisting chiefly of the delta of the Nile; 2. Middle Egypt, or *Vostani;* 3. Upper Egypt, or *Saïd.* The first of these presents no attractions to the invalid; it is in one of the latter that he must look for agreeable winter quarters.

It is during the temperate season only that the invalid can visit Egypt in safety, the excessive heat of the summer in the confined valley of the Nile being intolerable even to Europeans of robust constitution. The rise of the Nile begins in the month of June, and gradually proceeds until September, when, having remained stationary for a few days at its maximum height, it again subsides, leaving a rich alluvial deposit upon the surface of the country in its vicinity. Fevers and dysentery follow the retreat of the river to its winter bed; but by the end of November most if not all of the noxious effects of its overflow have disappeared, and the invalid traveller may commence his voyage towards Thebes without fear of molestation by the prevalent diseases of the country, provided he exercise an ordinary amount of precaution. The months of December, January, and February are the most pleasant for a sojourn in Middle and Upper Egypt. The air is dry and exhilarating; there is no dampness, no fog, and but rarely any dew. North winds prevail to temper the influence of the mid-day sun, which might otherwise be too powerful; but against the

low temperature of the night the invalid must protect himself by artificial means. The range of temperature throughout the twenty-four hours is wide, and on account of this untoward circumstance the climate of Egypt is so far objectionable; but, with due care, any evil consequences derivable from it may be avoided.

The proper period for setting out from this country, with a view of wintering in Egypt, depends in a great measure upon the resources of the invalid, and upon his or her desire to proceed thither either directly or by a circuitous route. If directly, then the beginning of November will be early enough, especially if by the overland route to Marseilles; but if Gibraltar, Malaga, Malta, or other places are to be explored by the way, then the invalid should not be later than the middle of October in taking his departure, and, moreover, should so arrange his tour as to arrive at Alexandria not later than about the end of November.

In order to diminish the travelling expenses, and to make the sojourn abroad as agreeable as possible, a party, consisting of not less than three or four, should arrange to travel together. By making early inquiry, a single invalid will generally find out others bent on a like errand with himself, with whom he may agree to travel on terms of mutual advantage. Except in cases where the party consists entirely of one family, a lady should never be without one of her own sex as a companion: one from her own rank of life would be preferable, but failing that, a female attendant may be taken. And let me repeat here what I have already so frequently mentioned about the quality and quantity of *clothing* that ought to be taken on such occasions, or rather, that I may impress the reader more deeply with the necessity of providing suitable apparel before setting out, I will quote the words of a physician,

himself much benefited by a recent winter spent in Egypt, who has published an excellent, because thoroughly practical, little work on the *Climate of Egypt*. Dr Dalrymple has the following on the subject of clothing:—"Let me peep into the numerous boxes, bags, and portmanteaus with which the party are encumbered, and which are to be their anxious care for the next six months. The ladies have, *inter alia*, got a couple of good dark-coloured silk dresses, besides a *best* one, for the possible and very probable hospitalities at Malta, Alexandria, or Cairo; a couple of mohair dresses, from which the dust is easily shaken—dust being the great enemy of their journey; there are no linen or washing dresses, unless the ladies wish either to serve an arduous apprenticeship to laundry work, or else to appear in limp garments fresh from the linen-bag. This is on the assumption that no maid is taken, usually the most helpless article imaginable. There are fine flannel or merino under-garments, fine coloured woollen or spun silk stockings; for without these woollens next the skin no invalid should travel. I particularly recommend a flannel belt for the body. To consumptive patients, who are all predisposed to intestinal irritation, it is of the utmost value. There is the bonnet-box, destined to be replenished hereafter in the Rue de la Paix; while on the head is a round *white* straw hat with an adequate but not too wide brim, which in a week or two will be covered with ample folds of white muslin. Some ladies may fancy Diana Vernons—nay, even go into Spanish or mandarins; but those who have due regard to their complexions, as well as to headaches, will take care to have brim enough to protect the one, and crown enough to avoid the other." Dr Dalrymple then recommends that three or four ounces of friar's balsam should be purchased, ten or twelve drops of which, in a saucer of water, is to be

applied freely to the face after exposure to the Egyptian sun. "Stout, really stout boots," he continues, "are essential. Some like brown leather—for blacking is bad, and the blackers worse; but this is an affair of taste. Many a hard stone and sharp fragment will be walked on or climbed over before they will again tread asphalte or York flag. The collars and cuffs, and suchlike feminine tires, should be simple, and easily got up. Clear-starching in the cabin, with the thermometer at 82 degrees, is not really pleasant, though highly edifying.

"The gentlemen will have their coloured flannel or spun silk shirts, Tweed or Melton suits of moderate thickness and medium colours, with plenty of pocket-room; they will also have a dress suit for presentations or special visits. Knickerbockers are capital Nile wear, and very nearly resemble the *Nizam* garment, which in the East clothes the same part of the nether man. The shoes and boots should be stout and brown, and of *English* make—neither French nor Cairene work withstands the wear and tear. Then there will be the gun-cases, a short Enfield or a Lancaster rifle for the pelicans, cranes, or chance crocodiles; a revolver, with belt and pouch. The events of Syria this year make this more than ever a requisite of travel. In no country does personal appearance go further than in the East; and though it is absurd to see a man got up extensively in Parisian or St James's Street fashion, yet a shabby coat and slovenly appearance have a decidedly mischievous effect. Unless a man is master of Arabic to a tolerable extent, let him not assume the Mussulman garb."

Such articles, then, are to form, in part, the contents of as few portmanteaus, &c., as they can be conveniently stowed into. Dr Dalrymple has inadvertently overlooked the "bundle," consisting of an extra shawl, loose cloak,

Highland cape, or other *wrap* for the cold evenings on the Nile boat; or perhaps he supposes such articles to be in actual use at the season when the invalid leaves England. Umbrellas may be required between England and the further side of the delta; and if of a light material and colour, may subsequently serve as parasols. In the work above quoted will be found, amongst other necessary information, a list of medicines suitable for the climate; form of contract with the dragoman; contract for hiring a Nile boat; the stores necessary for the voyage, &c.

The invalid may travel either by the steamboats of the Peninsular and Oriental Company direct from Southampton, or he may commence his voyage at Marseilles by the *Messageries Impériales* boats. At Malta he may break his journey by a rest of five or six days; and the only serious error he could fall into by doing so, would be that of hiring a Maltese dragoman. Their importunate entreaties to be hired should be resisted, however, for they have little or no influence in Egypt.

In the *Handbook for Egypt*, or in Dr Dalrymple's book, amongst others, all information respecting the hiring of a dragoman, of a Nile boat, as well as other preliminary information, will be readily found. One word only as to expense after reaching Cairo. Dr Dalrymple's party consisted of "four, two ladies and two gentlemen. We had a reis, pilot, and fourteen sailors, dragoman, cook, and soffragee, and a subbee for the crew; and the entire cost of everything, beer, wine, and spirits included, for thirteen weeks, was L.420. I am quite sure that, after my experience of one voyage, I could make a deduction of from 12 to 15 per cent. on this; but one buys Eastern experience *au poid d'or*."

The climate of Middle and Upper Egypt from December

to the end of February is dry and exhilarating, and, together with the peculiar mode of living, the attractive scenery, and the venerable associations of the country, affords to the invalid traveller means of restoration to health which he could in no wise procure at home. Much depends upon the condition of the mind in the treatment of the body; and there are many cases in which change of scenery alone, independent of the influence of climate, goes far to operate a cure. Egypt has peculiar advantages in this respect.

Before entering upon the distinctive climatological features of different parts of the country, I may offer a few remarks upon the meteorological phenomena common to Egypt generally.

Of the winds, the one most dreaded is the *Khamsin*. It is a hot and dry wind from the south-south-west. It usually sets in during the month of May, and continues to blow at intervals, as its name implies, for *fifty* days. All nature is alike depressed by it; the country is scorched, and the inhabitants are bowed down. The thermometer quickly ascends during its prevalence; the heat becomes stifling and oppressive; respiration is performed in a rapid and laborious manner; the skin is rendered dry, and sensible transpiration is entirely checked. When the sun passes towards the tropic of Cancer, northerly and north-westerly winds prevail; and when it returns towards the tropic of Capricorn, the winds vary between south-easterly and westerly. The northerly winds in the beginning of winter are taken advantage of in sailing up the Nile.

Rain, although common from October to March in Lower Egypt, is scarcely known in the upper parts of the valley of the Nile. Clouds are uncommon during the period generally spent by invalids upon the river, the atmosphere being usually remarkably clear. Snow is of rare occurrence

even in the most northerly parts of Egypt; but in 1833 it fell at Alexandria, at Rosetta, and at Atfeh, to the indescribable amazement of their inhabitants. Showers of hail fall at long intervals; Clot-Bey mentions one which he witnessed at Abouzabel in 1828, in which the pieces of ice were of such magnitude as to kill many animals, and to cause great destruction of property. Dew is largely deposited in Lower Egypt, especially during the prevalence of northerly winds; in the Nile Valley it is of comparatively rare occurrence.

A few sentences will suffice to impart a general knowledge of the climate of the different parts of Egypt in which the invalid may be found during the winter months.

Alexandria, although the first place visited by the invalid, is not in any way calculated to impress him with a favourable idea of the Egyptian climate. Surrounded on every side by water (on three by the Mediterranean, and on the fourth by the Lake Mareotis), its atmosphere, as might naturally be supposed, is largely charged with moisture. The valetudinarian will therefore make the best use of his time in visiting the "Sights" of this Eastern Emporium, and then proceed on his journey towards Upper Egypt.

Cairo is reached by railway from Alexandria. It is situated near the right bank of the Nile, at a distance of about five miles from the origin of its delta. The experience of several winter residents there will afford us a good deal of information respecting the character of its climate between the months of November and March. The coldest season at Cairo is that between the middle of December and the middle of January. Rain occasionally falls then, and the evenings are chill. In 1853–54 the Rev. Dr Barclay ascertained, by observations with a registered thermometer and Dolland's hygrometer, that the condition of the

climate from 25th December to 7th January inclusive was as follows:—Mean lowest temperature by night, 57·9; mean highest temperature by day, 62·2; mean diurnal range, 4·2; mean of dryness, 3·2; mean of humidity, 1·0 (the zero of the hygrometer corresponding to summer drought in Britain). During the same period there were six days of bright sunshine; two rainy and windy; one showery; two cloudy; two cloudy and windy; one drizzling.

In November 1855, from nineteen days' observation at Cairo, Mr Rhind deduced a mean temperature of 66·85 at 9 A.M., and 69·6 at 10 P.M. Dr Abbott, from thirty days' observation, in November 1855, gives the mean temperature at 9 A.M. as 63·1; from eleven days' observation in December, 68·1; from thirty-one days' observation in January 1856, 54·8; from twenty-nine days' in February, 56·5; from thirty-one days' in March, 56·3; from nine days' in April, 62·7, giving a mean, for the six months, at 9 A.M., of 60·25.

For the first seven days of March 1854, Dr Barclay records the following as the condition of the climate at Cairo: Mean lowest temperature by night, 68·0; mean highest temperature by day, 73·11; mean diurnal range, 5·11; mean of dryness, 4·4; mean of humidity, 0·28. The state of the weather from day to day was as follows:—Gentle breeze, sunny; ditto, ditto; fog; calm and sunny; haze; cloudy and sunny; drops of rain. Dr Barclay passed the days from 13th of March to 8th of April inclusive in the desert of Ghezeeh, near the Pyramids, of which place he records the following meteorological data:—Mean lowest temperature by night, 64·66; mean highest temperature by day, 71·66; mean diurnal range, 7·00; mean of dryness, 13·8. The state of the weather during that period is thus shown: twenty days of bright sunshine; one day of high wind; three days cloudy; one day cloudy and

blowing; one day on which the khamsin blew; one day on which rain fell.

From April 19th to 26th inclusive, at Cairo we derive the following *means* from Dr Barclay's observations:—Mean lowest temperature by night, 69·25; mean highest temperature by day, 73·62; mean diurnal range, 4·37; mean of dryness, 5·9. Concerning the state of the weather, he says:—"A gentle breeze of wind and bright sunshine by day. Always calm towards evening and during the night."

Thus it appears that, with its general mildness and equability the climate of Cairo is not without certain vicissitudes which might perhaps prove troublesome to sensitive invalids. It is in Upper Egypt where freedom from such changes must be sought.

From Dr Barclay's work, again, we ascertain that between Thebes and Asouan, from the 17th to the 23d of January, the following was the condition of the climate:—Mean lowest temperature by night, 65·43; mean highest temperature by day, 70·28; mean diurnal range, 4·85. The state of the weather during the same period was:—"Cloudless sky, and bright sunshine every day; the firmament blazing with stars every night; no evening chills."

Lord Haddo gives the temperature of January 1855 on the Nile, from thirty-one days' observation, at 7 A.M., 49·0,—at 9 P.M., 50·5; and that of February, from fifteen days' observation, at 7 A.M., 55·9,—at 9 P.M., 68·5.

Sir Gardiner Wilkinson (author of the *Handbook for Egypt*) gives the temperature of the atmosphere on the Nile, from three days' observation in November 1848, as 60·15; for December, from thirteen days' observation, 64·8; for February 1859, from two days' observation, 64·0; for March, from eight days' observation, 70·15.

Dr Dalrymple, to whose elaborate tables I would draw

the reader's attention, gives the following as the reading of his instruments upon the Nile from December 1859 to March 1860 :—

Time.	Latitude.	Mean of Barometer.	Mean Temp.	Max.	Min.	Average Range.
Dec. (24 to 31),	29° 8′ to 27° 13′	29·724	58·5	75	39	36
January, . .	27° 13′ to 22° 10′	29·540	59·2	82	38	44
February, . .	25° 55′ to 31° 56′	29·398	60·4	90	40	50
March, . . .	29° 8′	29·649	58·1	70	49	30

"A few drops of rain," he says, "fell on the 29th of December and on the 1st of January, but not enough to moisten the rain-gauge. On the 29th of February there were two heavy but brief showers at Cairo, being the only real rain that fell since leaving Alexandria. On the 7th February, and for the two following days, a most violent storm of wind from west-north-west occurred while at Thebes, making it well-nigh impossible to leave the boat. The same took place on the 18th and 19th, though less violent. It succeeded very suddenly to intense heat; the thermometer touched its highest point on that day. On February 27th another violent wind storm, but of still shorter duration. The mean temperature of the above period observed appears to be about the same as our three months of June, July, and August; and the humidity, as compared with the mean humidity of June, July, and August for the last six years, as 56 to 81, showing a very remarkably high degree of dryness of the atmosphere of Egypt as compared with that of our own."

It will be observed, then, that the best season for ascending the Nile is that from about the 25th of November to the middle of December. Whether the invalid traveller should ascend beyond Thebes is a matter to be decided by

be so regulated as t
beginning of April.
leisurely home; and
England too soon (l
will find it necessary
ranean. Syria, Const
places may be visited;
cularly careful against
and over-fatigue, otherw
his winter's work.

The diseases to which
subject may be said to l
stances—heat, humidity,
and a want of cleanliness
the most common disorde
skin are frequently met
rhoids and hernia, as wel
calculous disorders, and c
plexy, are by no means
and small-pox have at va
in the large towns. Diarr
mon disorders in the delt
arrived invalid

A climate divested of cold piercing winds, of rain, snow, and frost; a dry, exhilarating climate. Now what are the varieties of bodily infirmity to which a winter residence in such a locality, teeming with objects of interest, would prove beneficial? Pulmonary consumption, if taken at a proper stage, is undoubtedly one; bronchitis, when marked by a relaxed state of the tissues, with copious expectoration, and humoral asthma, though, from the capricious nature of the latter, a beneficial result cannot be so safely predicted. And finally, a winter in Egypt may be recommended in almost every case in which there is functional disorder—perhaps even when combined with more or less of organic lesion—the result of a protracted application to business matters, of over-study, or of too free living. Dyspepsia, of the atonic variety, hypochondriasis, and many other nervous disorders, may be classed under the latter head, when they are indicative of the evil consequences which follow an undue taxation of the brain and nervous system generally.

WEST INDIA ISLANDS.

The West Indies are situated almost entirely within the tropics, and are necessarily characterised by a high mean annual temperature. The peculiar configuration of some of the larger islands, however, renders them habitable by Europeans even in the fervent heat of summer. In the elevated parts of some of them, the atmosphere is never very oppressive, the refreshing sea breeze sweeping over their surface to mitigate the glowing rays of a tropical sun. The difference between the climate of the lowlands and that at an elevation of even a thousand or twelve hundred feet above the level of the sea is very striking, the latter being,

in a great measure, exempt from the diseases which prevail in the swampy grounds below.

The seasons are chiefly marked by their temperature, and by the absence or presence of heavy falls of rain. Spring is of brief duration; it may be said to occupy but little more than the month of April, and is attended with more or less of rain. From May to October is the summer season, usually very dry and hot, but invariably tempered by the influence of the sea breeze during the day, which gives place in the evening to a land wind. In October the rainy season sets in with all the violence of tropical torrents, and continues until December, when a more enjoyable period supervenes, which lasts until the commencement of the hot season.

As resorts for invalids, the West India Islands have been the subject of much controversy, and their sanative influence is still a moot point. The diseases in which they are usually recommended as winter quarters are those for which a residence in a mild southern climate during the colder months of the year is generally considered essential. Consumption, bronchial affections, rheumatism, and scrofula, have all been supposed to be amenable to the influence of the West Indian climate, and there can be little doubt that, in some instances, it exercises a decidedly beneficial effect upon invalids suffering from such maladies.

In removing for a season to the West Indies, however, it should be remembered that the invalid exposes himself to diseases of a far more formidable and rapid character than any for which he can seek the benefits of the climate. Fever and inflammatory disorders are common in the West Indies, one of which may put a period to his existence in a few days, or even hours. It is quite true that, with great care, he may avoid such a calamity; but the least incau-

tious exposure may lead to very serious consequences. That these islands are not so unhealthy as they were many years ago is quite true, but it is nevertheless a subject for serious consideration whether invalids, suffering from a chronic malady, should be recommended, without having any other object in view than the alleviation of their disease, to incur a great expense, and to run an unavoidable risk of their lives, by spending a season in a locality subject to endemic diseases of a fatal character. In the case of a person having a commercial interest at stake, as well as an impaired constitution to renovate, the climate of the West Indies would have a double chance of affording relief, because the excitement which invariably attends the transaction of business concerns would withdraw the invalid's attention from dwelling too exclusively upon the nature and progress of his disorder, whilst, at the same time, it would probably cause him to take more active exercise than he would otherwise be inclined to do in a climate of such a character.

The powers of the digestive system are almost always reduced by a change to the West Indies, and for at least a little while the entire constitution is deranged, so that persons whose general health is shattered should be extremely cautious whilst living there. Transitions from sunshine to shade, and all causes by which the invalid is exposed to the effects of sudden vicissitudes of temperature, are to be carefully avoided. Coughs and colds are of common occurrence amongst Europeans resident in these islands, so that consumptive and bronchitic invalids should be constantly on their guard. The best time to arrive in the West Indies is about the beginning of December, after the heavy autumnal rains, and no invalid should remain later than the end of April. A moderate diet and suffi-

cient clothing, with flannel next the skin, must be enjoined. A few of the principal islands only need be noticed.

JAMAICA—the chief of the British possessions in the West Indies—is situated between Lat. 17° 40′ and 18° 30′ N., and Long. 76° 15′ and 78° 25′ W. The island is about 150 miles long, with an average of 40 in breadth, and a superficial area of about 4250 square miles. It is traversed from east to west by the Blue Mountains, which have an elevation of 7000 to 8000 feet above the level of the sea. The northern side of the island is reputed the most healthy; it is moderately undulating, and sweeps gradually down from the mountain heights to the sea, whilst the south side is bold and precipitous.

Jamaica is divided into three counties, Middlesex, Surrey, and Cornwall, and is subdivided into twenty-one parishes. The chief towns are Spanish-Town, the capital; Kingston, the chief port; and Port-Royal. The scenery of the island is remarkably picturesque, partaking somewhat of the character of Ceylon or Java.

The difference in elevation of various parts of the island, and the varieties of exposure according to the relative position of the mountains, give to Jamaica a diversity of climate which would scarcely be expected from its situation within the tropics. The mean annual temperature at Kingston, according to Professor Dove's tables, is 78·77.; that of the seasons and months being as follows:—Winter, 76·16; spring, 78·07; summer, 81·09; autumn, 79·75. January, 75·73; February, 76·00; March, 75·78; April, 78·08; May, 80·27; June, 80·6; July, 81·67; August, 81·00; September, 80·73; October, 79·80; November, 78·73; December, 76·74.

Thick masses of cloud frequently interpose between the island and the almost vertical rays of the sun, and afford

considerable relief in the hot season. The elevated parts of the island are always much cooler than those at the sea-level, a mean annual difference of thirteen degrees having been observed between the temperature of Up-Park Camp, near Kingston, and that of Pleasant Hill, in the Port-Royal Mountains, at an elevation of about 4000 feet.

According to Martin, the average range of temperature at these two places during the different months is as follows :—

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Pleasant Hill...	61·64	61·65	62·68	63·71	65·73	66·75	70·79	69·81	69·79	66·72	65·70	62·68
Up-Park Camp	71·84	72·84	77·86	79·87	75·87	78·86	77·89	77·87	76·89	74·86	73·85	73·84

The same author records his own experience of the difference between the lowlands and uplands in the following words :—" I have often experienced, in different parts of the globe, the rapid diminution of temperature consequent upon exchanging a lowland for a highland climate, but never more remarkably than in this part of Jamaica. In the middle of May I left the hospitable mansion of Mr Atkinson at 6 A.M., after a restless and feverish night on the plain of Liguanea, not far from Up-Park Camp; and at noon, under the guidance of a kind friend, reached *Pleasant Hill*, part of the journey having been performed in a carriage, and the remainder on mules, over narrow mountain roads, down steep declivities, across the rapid Yallahs River, and amid grand, picturesque, and ever varying scenery. The change of climate was delicious, the air cool, fragrant with the white and red rose, and perfumed with the orange blossom. On the Liguanea Plain, during the previous night, the lightest covering had been scarcely bearable, yet at *Pleasant Hill* a couple of blankets were agreeable. At

Abbey Green, about 5000 feet above the sea, the highest habitation and coffee plantation in the island, a fire during the evenings in June was acceptable. . . . On the 21st May I rode thirty miles in the mountains, and was on horseback ten hours, without suffering much fatigue, a day's work not easily accomplishable in the lowlands."

The pleasantest months of the year at Jamaica are December, January, February, and March; April and May are frequently showery, and are followed by the hot and dry months of June, July, and August. Autumn is the season of heavy rains and hurricanes, both of which frequently commit great destruction in the island.

More rain falls on the north than on the south side of the island, although the showers are heavier in the latter. At the village of Manchioneal, from an average of nine years (1830–39), the annual fall of rain is shown to be 103·52 inches; of which 60 may be precipitated between 1st January and 31st August, and 42·92 from 1st September to 31st December. Others estimate the quantity at a much lower figure; at Newcastle Barracks it is said to be 70 inches. During the greater portion of the year the easterly or *trade* wind prevails in Jamaica. Fevers, dysentery, diarrhœa, rheumatism, and influenza, are the prevailing maladies of the island. Cholera, too, from time to time makes its way thither. Amongst the natives, diseases which result from insufficient nourishment, unwholesome habitations, and a want of cleanliness, are the chief; cutaneous eruptions, ulcers, and *yaws*, a kind of leprosy, being most common.

The year 1859 was a very healthy one amongst the troops in Jamaica. One-third of the admissions into hospital, and of the deaths amongst white men, was caused by miasmatic diseases. Of these the following were the chief

varieties:—Paroxysmal and continued fevers, dysentery, diarrhœa, cholera, sore throat, ophthalmia, rheumatism. The number of patients admitted for paroxysmal fever was remarkably low, being only 131 per thousand of strength, and of these only 4·81 per thousand of strength died. But an average of years from 1817 to 1836 gives the number of admissions for the same class of fevers as 8·63 per thousand of strength, and the deaths as 100·18; namely, not less than one-tenth of the entire force.

Ophthalmia caused an admission into hospital of 207 per thousand of the strength. "Tubercular diseases," says the "Army Medical Report for 1859," "which were formerly a source of considerable mortality in Jamaica, have not been the cause of a single admission"—that is to say, among the white men; but of the black men he says,—"Tubercular diseases continue to be a source of great mortality among the negroes, the proportion of deaths in 1859 having been as high as 8·67 per thousand of the strength." Diseases of the respiratory organs, of the digestive apparatus, and of the integumentary system, appear to be the most common.

Jamaica offers a great variety of climate, and is therefore one of the best of the West India islands for invalids to reside at, who can afford to remove from place to place, in order to put themselves continually in the most advantageous positions. Scrofulous children, and persons threatened with consumption, but in whom there is no active disease, might be sent there. Persons suffering from bronchial affections, as well as rheumatic patients, in whom the constitution is not materially implicated, might also derive benefit from a sojourn at Jamaica. But dyspeptic invalids, and those in whom there is a tendency to disease of the nervous system, would scarcely find it a suitable place of residence.

BAHAMAS—The climate of these islands is equable, and is much resorted to by American invalids suffering from pulmonary consumption. The winds, however, are variable, and often very trying for delicate persons. The temperature ranges from 73° to 93°.

BERMUDAS. — These islands are generally moderately healthy. Influenza raged amongst the white population in 1842. Rheumatism, dysentery, and yellow fever, are the prevailing diseases. The mean annual, seasonal, and mensual temperature of Bermuda, according to Professor Dove, is as follows:—Year, 67·40. Winter, 60·62; spring, 58·76; summer, 63·74; autumn, 71·90. January, 56·84; February, 58·82; March, 59·36; April, 62·78; May, 69·08; June, 73·22; July, 75·74; August, 76·64; September, 76·82; October, 73·04; November, 65·84; December, 60·62.

BARBADOES.—In this group the climate is somewhat uniform, and rather dry. The average annual fall of rain is about 72 inches. Hurricanes and earthquakes are common. The north-east is the prevailing wind. Yellow fever is severe in the Barbadoes. The temperature for a portion of the year is as follows:—Summer, 80·36; autumn, 79·72. January, 76·11; May, 79·77; June, 80·40; July, 80·05; August, 80·63; September, 79·58; October, 79·72; November, 79·86; December, 76·79.

INDEX.

Abano, 411.
Aberystwith, 356.
Acqua Acetosa, 418.
Acqua Santa, 418.
Acqui, 412.
Adelaide, 154, 165.
Ague, 66.
Ainyagout, 112.
Airthrey, 356.
Aix (*Bouches-du-Rhone*), 228.
Aix (*Savoy*), 228.
Aix-la-Chapelle, 282.
Albany, 165.
Albenga, 401.
Albisola, 401.
Aldfield, 356.
Alet, 225.
Alexandria, 490.
Algeria, 92.
  Geographical position, 93.
  Coast line, 93.
  Mountains, 94, 97.
  Tell and Sahara, 94.
  Rivers, 95.
  Marshes, 96.
  Lakes, 96.
  Soil 97.
  Geology, 97.
  Division into Provinces, 98.
  Mineral waters, 98.
  [*See* Oran, Constantine, Philipville, Bona, Hammam Meskhoutin.]
Algiers, 116.
  preliminary observations on, 116.
Algiers, journey to, 117.
  hotels, 121.
  inhabitants, 122.
  St Eugène, 124.
  Mustapha, 124.
  Plain of Mitidja, 125.
  El-Biar, 125.
  Il Bel Respiro, 124.
  Hammam Melóuane, 126.
  Rovigo, 126.
  Oïoun Sekhakhna, 128.
  Hammam R'Ira, 129.
  Climate of, 132.
  Meteorological Table, 133.
Alhaurin, 462.
Alicante, 450.
Allan, Bridge of, 356.
Allevard, 225.
Altitude, climates of, 5.
Altwasser, 284.
Amand-les-Eaux, St, 225.
Amélie-les-Bains, 226.
Anœmia, 67.
Apoplexy, 68.
Arctic current, 8.
Arles-les-Bains, 226.
Arles-sur-Tech, 226.
Arona, 419.
Ashby-de-la-Zouch, 356.
Askern, 357.
Asthma, 68.
Atlas Mountains, 94.
Atmosphere, height of, 12.
  constitution of, 13.
  a pure, 13.
  dry and moist, effects of a, 17.

Auckland, 162, 165.
Audinac, 228.
Aulus, 228.
Australia, 140. 141.
South, 153.
Western, 155.
Auteuil, 229.
Avène, 229.
Ax, 230.
Azores, 440.

Baden (Austria), 284.
Baden (Switzerland), 285.
Baden-Baden, 285.
Bagnères-de-Bigorre, 231.
Bagnères-de-Luchon, 233.
Bagnoles, 235.
Bagnols, 235.
Bahamas, 502.
Baise, 887.
Bains, 235.
Balaruc, 236.
Balearic Isles, 118.
Barbadoes, 502.
Barbazan, 236.
Barbotan, 237.
Barcelona, 452.
Barège, 237.
Bath, 357.
Bathing, sea, 42.
effects of, 43.
when commendable, 43.
when contra-indicated, 43.
time and place for, 43.
Bathna, 112.
Baths, necessity for, 39.
warm, 39.
cold, 39.
Turkish, 39.
erroneous method of commencing, 40.
sponge, 41.
"Dripping sheet," 41.
Shower, 41.
Reaction after, 42.
of Warm Sea Water, 44.
of mineral water, 57.
mud, 63.
Bathurst, 143.
Baveno, 418.
Belgium, 282.
Bellagio, 415.
Bermudas, 502.
Biarritz, 214.
Bilin, 286.
Birmenstorf, 286.
Bise, the, 194.
Biskra, 115.
Blidah, 126.
Bocklet, 286.
Bona, 103.
Bondonneau, 240.
Borcette, 287.
Bordighera, 401.
Boulou (Le), 240.
Bourbon-Lancy, 240.
Bourbon-L'Archambault, 240.
Bourbonne, 241.
Bourboule (La), 241.
Bournemouth, 316.
Breton, Cape, 178.
Brides, 242.
Bridlington Quay, 371.
Brighton, 317.
Bristol Hot Well, 327.
British Isles, 314.
Winter Climates of, 316.
Summer resorts of, 355.
Bronchial affections, 69.
Brückenau, 287.
Brunswick, New, 174.
Budleigh Salterton, 319.
Bussang, 242.
Bute, 320.
Buxton, 359.

Cachexia, 67.
Oranensis, 101.
Cadéac, 242.
Cadiz, 463.
Caille (La), 243.
Cairo, 490.
Calculi (urinary), 71.
Cambo, 243.
Campagne, 244.
Canada, 166.
Canaries, 445.
Cannes, 195.
Canstatt, 288.
Canterbury, New, 163.
Capbern (Capvern), 244.
Cape Town, 183.

Carlsbad, 287.
Carratraca, springs of, 463.
Casares, 470.
Casteljaloux, 246.
Castellamare, 413.
Castera Verduzan, 247.
Catamenia, 72.
Catarrhus Epidemicus (influenza), 74.
Cauterets, 248.
Celles, 250.
Challes, 250.
Channel Islands, 350.
Charbonnière, 250.
Chateau-Gonthier, 251.
Chateauneuf, 250.
Chateldon, 251.
Chaudefontaine, 288.
Chaudes-Aigues, 251.
Cheltenham, 360.
Chiavari, 402.
Children, hygienic treatment of, 51.
Chlorosis, 67.
Chorea, 74.
Christau (St), 251.
Cintra, 469.
Clifton, 325.
Climacteric diseases, 73.
Climate, mathematical definition, 1.
modern definition, 2.
causes of physical, 4.
(*a*) Distance from equator, 4.
(*b*) Elevation, 5.
(*c*) Relative position of sea and land, 7.
(*d*) Oceanic currents, 8.
(*e*) Local accidents, 8.
(*f*) Aspect or exposure, 9.
(*g*) Soil, 10.
(*h*) State of cultivation, 11.
maritime, 7.
insular 7.
continental, 7.
effects of, upon nations, 25.
of England, Sir H. Davy upon, 26.
change of, abuse of, 27.
Sir James Clark on, 28.
preliminary considerations, 30.
Clothing, 44.
Clothing, form and quantity of, 45.
object of, 45.
flannel, the sheet-anchor of, 46.
necessary in Britain, 46.
waterproof, injurious, 46.
wet, dangers of, 47.
night, quality of, 47.
overcoats, 47.
Spanish cloak, 47.
in warm climates, 47.
Clouds, the effects of, on climate, 12.
Coburg Peninsula, 165.
Col-de-Sfa, 115.
Columbia, British, 180.
Como Lake, 415.
Constantine, province of, 102.
town, 109.
excursions from, 110.
Controxéville, 251.
Cook Strait, 163, 164.
Corfu, 472.
Cove (Queenstown), 333.
Cransac, 252.
Cretinism, 12.
Croft, 361.
Croix de Marbre, La, 206.
Cutaneous diseases, 75.

Darjeeling, Sanitarium of, 6.
Dawlish, 328.
Dax, 252.
Denis (St), 252.
Dew, 21.
Diet (see Food).
Digne, 252.
Dinsdale, 361.
Diseases, a sketch of the, in which change of climate is commendable, 66.
Dreams, 54.
Driburg, 288.
Dundas (Fort), 165.
Durban, 188, 192.
Dyspepsia, 75.

Early rising, 54.
Earn, Bridge of, 367.
Eaux-Bonnes, 253.
Eaux-Chaudes, 255.
Edward's Island, Prince, 178.

Eger, 288.
Egypt, 488.
El-Biar, 125.
Electricity, atmospheric, 14.
El-Kantara, 114.
El-Ksour, 114.
El-ou-Taia, 115.
Ems, 288.
Encausse, 257.
Enghien, 257.
Epilepsy, 78.
Escaldas, 258.
Eugène (St), 124.
Evian, 258.
Exercise, necessity for, 48.
quality and quantity of, 48.
time of taking, 49.
varieties of, 50.
essential to children, 51.
precautions whilst taking, 52.
mental, 52.
Exmouth, 329.

Fachingen, 290.
Fever, Yellow, influenced by elevation, 6.
Filey, 371.
Flannel (see Clothing).
Florence, 387.
Foncirgue, 258.
Food, change of climate necessitates change of, 34.
illustrative case, 35.
zones of, 36.
continental, 37.
times for taking, 38.
France, winter residences in, 198.
Mistral of, 198.
Bise of, 194.
Summer Resorts in, 216
Franzensbad (Eger), 291
Fredericshall, 292.
Fredericton, 175.
Friction, 42.
Funchal, 428.
Fundy, Bay of, 175.

Gais, 293.
Gamarde, 259.
Garments (see Clothing).
Gases, diffusive power of, 13.
Gastein, 293.
Gazost, 259.
Geilnau, 295.
Genoa, 389.
Germany, 282.
Gervais (St), 260.
Gibraltar, 469.
Gilsland, 361.
Gleichenberg, 295.
Gout, 78.
Gozo, Island of, 477.
Greoulx, 260.
Gulf-Stream, 8, 314.

Hammam-Melouane, 126.
Hammam-Meskhoutin, 104.
Hammam R'Ira, 129.
Harrogate, 362.
Hastings, 330.
Health, Paley on, 29.
Hedionda, baths of, 470.
Heilbronn, 295.
Hippocrates, on aspects, 9.
Hobart Town, 158.
Homburg, 295.
Honoré (St), 261.
Hope, Cape of Good, 181.
Hydro-Meteors, 17.
Hygienics, 25.
Hyères, 195.
Hypochondriasis, 79.
Hysteria, 74.

Innerleithen, 364.
Insolation, effects of, 16
Ionian Islands, 472.
Ireland, 314.
Ischia, 416.
Ischl, 296.
Isothermal lines, 24.
Italy, 373.
topography of, 374.
geology of, 375.
marshes of, 376.
well watered, 377.
rain in, 378.
winds of, 379.
isothermal lines, 382.
temperature of, compared with that of other climates, 383.
snow in, 384.

Italy, winter climates of, 384, 387.
summer residences in, 411.

Jackson, Port, 147, 165.
Jamaica, 498.
Jersey, 350.

Kidneys, diseases of, 80.
Kissingen, 296.
Kreuznach, 298.
Kronthal, 299.

Labassère, 261.
Laguna, 447.
Lakes, effects of, on climate, 11.
Lambessa, 112.
Lands, clay, 10.
chalky, 10.
sandy, 10.
gravelly, 10.
marshy, 11.
colour of, 10.
Languedoc, 194.
Laryngeal affections, 69.
Latitude, climates of, 5.
Launceston, 158.
Lavardens, 262.
Lavey, 299.
Leamington, 364.
Leghorn, 419.
Leinster, New, 159.
Leonard's (St), 331.
Leste, the, 435.
Leuken (Leukerbad, Loeche), 299.
Libeccio, the, 380.
Liebenzell, 301.
Lippspringe, 301.
Lisbon, 463.
Liver, diseases of, 80.
Lucca, baths of, 419.
Luxeuil, 262.

Macquarie Harbour, 165.
Madeira, 425.
meteorological table for, 431.
Leste at, 435.
Madrid, 454.
Maggiore, Lago, 418.
Majorca, 119.
Malaga, 456.
Malaria, 20.
Malou (La), 268.
Malta, 477.
Malvern, 365.
Marie (St), 268.
Marienbad, 301.
Maritzburg, Pieter, 187, 192.
Marlioz, 264.
Marseilles, 118, 197.
Marshes, effects of, on climate, 11, 20.
of Algeria, 96.
Matlock, 366.
Meals, (see Food).
Medeah, 126.
Medicines, careful use of, enjoined, 88.
Melbourne, 151–165.
Mentone, 197, 401.
Mers-el-Keber, 100.
Mexico, 6.
Michael's Island (St), 441.
mineral springs of, 441.
Middleton, 361.
Milan, 391.
Milianah, 126.
Mineral Waters, 55.
definition of, 56.
sea typical of, 56.
general constitution of, 56–58.
action of, 57.
manner of administration of, 57.
varieties of, 57.
gaseous or acidulous, 58.
sulphurous, 59.
alkaline, 61.
chalybeate, 62.
bromo-ioduretted, 62.
saline, 63.
abuse of, dangerous, 64.
Minorca, 119.
Mistral, the, 193, 381, 390.
Mlilah, 112.
Moffat, 366.
Moltig, 264.
Monaco, 400.
Monetier (Le), 265.
Mont-Dore, 264.
Monte-Catini, 420.
Montmirail, 265.
Montpellier, 201.

Montreal, 169–172.
Moreton Bay, 143–150.
Motte (La), 265.
Mountains, effects of, on climate, 12.
a cause of rain, 19.
Munster, New, 159.
Mustapha, 124.

Naples, 393.
Natal, 185.
Nauheim, 302.
Nectaire (St), 266.
Neris, 266.
Nervi, 402.
Neuralgia, 80.
Newfoundland, 178.
Neyrac, 266.
Nice, 202.
Niederbronn, 266.
Nile, the, 484.
Nismes, 201.

Oïoun Sekhakhna, 128.
Olette, 267.
Oneglia, 401.
Ontario Lake, 171.
Oran, 99.
thermal springs of, 100.
climate of, 101.
cholera in, 102.
Otago, 163.
Ouregla, 115.
Ozone, 14.

Paralysis, 81.
Paramatta, 143.
Passy, 267.
Pau, 206.
Pegli, 401.
Penticosa, 268.
Penzance, 331.
Perth (Australia), 155.
Pfeffers, 303.
Philipville, 103.
Phillip, Port, 147–150.
Phthisis Pulmonalis, 81.
Pierrefonds, 268.
Pisa, 397.
Pitcaithley, 367.
Plombières, 268.
Plymouth, New, 163.
Pougues, 269.
Pouillon, 269.
Pozzuoli, 399.
Prechac, 270.
Preste (La), 270.
Provence, 194.
Pullna, 303.
Pulmonary consumption, 81.
Pyrenees, 216.
Pyrmont, 304.

Quebec, 169, 172, 174.
Queenstown, 333.

Rachitis, 90.
Rain, 18, 19.
Rapolano, 422.
Récoaro, 421.
Remo (St), 401.
Rennes, 271.
Residence, choice of a, 32.
Rheumatism, chronic, 89.
Riviera di Genova, 400.
Riviera di Levante, 401.
Rivers, effects of, on climate, 11.
Roccabruna, 401.
Rome, 402.
Ronda, 462.
Rondebosch, 185.
Rovigo, 126.
Royat, 271.

Sahara, the, 95.
Saidschutz, 304.
Salcombe, 335.
Salerno, 407.
Salins (Jura), 271.
Salins (Savoy), 271.
Salzbrunn, 304.
Santa-Cruz, 446.
Santa Maura, 473.
Sauveur (St), 272.
Savona, 401.
Saxon, 304.
Scarborough, 368.
Scotia, Nova, 176.
Schintznach, 304.
Schlangenbad, 305.
Schwalbach, 306.
Schwalheim, 306.
Scrofula, 90.

Sea, temperature of, 7.
Sea water, internal use of, 42.
the type of mineral waters, 56.
constitution of, 56.
warm baths of, 44.
Sedlitz, 306.
Selters, 306.
Sesto Calende, 419.
Sestri di Levante, 402.
Sestri di Ponente, 401.
Sidmouth, 335.
Sidi-Okba, 115.
Siena, 421.
Siradan, 273.
Sirocco, the, 379.
Sky, aspect of, 12.
Sleep, 52.
amount necessary, 52.
"golden," 54.
schemes for inducing, 54.
Snow, line of perpetual, 6.
Soden, 307.
Sorrento, 422.
Spa, 307.
Spain, 448.
Spezia, 402.
Strathpeffer, 369.
Surgical diseases, 91.
Sun, influence on temperature, 4.
Sydney, 143.
Sylvanès, 274.
Switzerland, 282.

Tarascon, 274.
Tarasp, 308.
Tasmania, 140, 156.
Teignmouth, 336.
Tell, the, 94.
Temperature diminished by elevation, 5, 6, 23.
Tercis, 274.
Thebes, 492.
Toeplitz, 309.
Toronto, 171, 178.
Torquay, 337.
Torre Molinos, 462.
Trees, effects of, on climate, 11.
Tunbridge Wells, 370.
Turbia, 400.

Ulster, New, 159.
Undercliffe, 345.
Uriage, 275.
Ussat, 275.

Valetta, 477.
Vals, 276.
Van Dieman's Land, 156.
Varena, 415.
Venice, 408.
Ventilation, 34.
Ventimiglia, 401.
Vernet-les-Bains, 276.
Vicarello, 423.
Vichy, 278.
Vic-sur-Cère, 281.
Victoria, 150.
Villa Franca, 214.
Vinça, 281.
Vittel, 281.
Viterbo, 423.
Voltri, 401.
Võslau, 310.
Voyage, a sea, utility of, 88.

Wales, New South, 142.
Weilbach, 310.
Weissenberg, 311.
Wellington, 168.
West Indies, 495.
Whitby, 370.
Wick, 319.
Wiesbaden, 311.
Wight, Isle of, 345.
Wildbad, 312.
Wildegg, 313.
Wildungen, 313.
Winds, 22.
Wines, continental, 87.
Woodhall, 371.
Woolnorth, 165.
Worthing, 348.
Wynberg, 185.

York (Australia), 165.

Zaatcha, 115.
Zante, 473.
Zealand, New, 159.

PRINTED BY NEILL AND COMPANY, EDINBURGH.

By the same Author,

(Second Thousand, Price 7s. 6d.,)

THE LIFE OF DR SCORESBY.

OPINIONS OF THE PRESS.

"While rendering full justice to Dr Scoresby's merits, and they were numerous, Dr Jackson has not weakened his biography by the too prevalent vice of excessive and ill-judged adulation, and has told the story of his uncle's life in a praiseworthy manner."—*Athenæum.*

"The simple narrative of his career contained in this volume, should be read alike by sailors and landsmen. It is a book to do one service every way, and we must congratulate Dr Scoresby-Jackson on having performed a difficult task with great ability and discretion."—*Literary Gazette.*

"The story from these, and a few supplementary sources, is that of a lifetime abounding in adventure, as full as it could well have been of professional labour, first as a seaman, afterwards as a working clergyman, and yet signally rich in contributions to abstract and applied science."—*Spectator.*

"We have refrained from quoting any of the amusing or exciting passages with which it abounds, for they must be read in the book itself to be fully appreciated; and it is a book which ought not to be borrowed merely, but wherever there is a family it should form a standard volume. It contains reading for all ages, and every day of the week; it is full of incidents such as happen to few, of actions which ennoble, and of truths which all should know. It is the picture of a life well spent."—*The Critic.*

"The details of Dr Scoresby's adventurous and chequered life are given in an interesting manner by his nephew, and they amply reward a diligent perusal. The zeal and earnestness of Dr Scoresby in his Arctic explorations, his scientific research, the discoveries he made, and the striking incidents of his sea voyages, are well portrayed; and his Christian labours as an English clergyman are faithfully recorded. We consider the work as a valuable addition to the department of biography."—*Edinburgh New Philosophical Journal.*

"This memoir is free from the vices which usually distinguish the writings about each other of near relations. It records in an interesting manner particulars of a useful and remarkably active life."—*British Quarterly Review.*

"We conclude our notice of recent biographies by expressing our approval of the judicious manner in which Dr Scoresby-Jackson has dealt with the life of his uncle, William Scoresby. In this narrative of the strangely chequered career of the whale-fisher, the seaman, the man of science, the doctor of divinity, the social reformer, and the seaman's friend, both young and old will find much to imitate, and more to admire."—*Museum.*

"The lives of scientific men are frequently devoid of stirring incidents, but Dr Scoresby's biography is a brilliant exception. It is a record of a self-made man, of exciting adventures, of one whose nobility of character, benevolence, and piety were more resplendent than that high intellectuality which procured him European celebrity.

"Our sketch is necessarily imperfect, but elaborate enough, we hope, to recommend this excellently-written biography to our readers. It is a book which cannot be read without pleasure and profit."—*Atlas.*

"This characteristic will enhance its value, as offering an example of a good man's life in circumstances not the most favourable for exhibiting the qualities portrayed, and we feel confident that Dr Scoresby-Jackson's labours will be gratefully appreciated by a very extensive circle of the British public."—*Manchester Guardian.*

". . . . . As Arctic explorer, man of science, and preacher of religion, there is plenty of lively incident as well as wholesome lesson in his life of sixty-seven years' duration. . . . . Dr Scoresby-Jackson writes in full sympathy with his uncle's life and character, and his volume is well worth reading."—*Examiner.*

"This is a more than ordinarily interesting volume. Men of all classes will welcome its appearance. . . . . The author has condensed and moulded with great literary success his multifarious materials into a clear-connected narrative that never flags or loses interest from beginning to end."—*Bradford Observer.*

"The biographer has done ample justice to the subject, and we are glad to possess a fitting memorial of one whose name is not only dear to every school-boy, but is highly esteemed by the philosopher and the Christian."—*Edinburgh Evening Courant.*

"Many exceedingly interesting extracts might be culled from this life, for which all readers of biography will heartily thank Dr Scoresby-Jackson."—*Scotsman.*

"The volume is full of interesting matters, collected chiefly from the original journals and letters of Dr Scoresby, whose style is simple, yet vigorous and effective; and the editor has shown very judicious management in not overloading his subject with too much detail,—a very general fault in most biographies of the present time."—*Witness.*

"We cannot, however, dwell upon his character as we would like. Our limits are already exhausted; and we can only repeat our congratulations to the author for the excellent manner in which he has executed the duty laid upon him, and tender him our thanks for the interesting book which he has given us,—a book which we recommend most heartily to all our readers, both old and young, as a most instructive, interesting, and profitable one."—*Scottish Press.*

"This is one of the most fascinating volumes we have met with for a long time, and it records the life and adventures of one of the most interesting characters of our day; of one who was at once an adventurous, able, and successful sailor, an eminent man of science, and a faithful and laborious minister of the gospel."—*Edinburgh Evening Post.*

"Dr Scoresby-Jackson has discharged his duty with great faithfulness as well as with great success. His work is a finished record of the leading events of a life pre-eminently remarkable."—*Caledonian Mercury.*

"The life of William Scoresby presents a remarkable instance of what may be accomplished by earnest application, accompanied by a strict sense of moral and religious duty."—*Manchester Examiner.*

"Dr Scoresby-Jackson has arranged his materials with good judgment, and in every varied department of the life there is that which will both entertain and instruct us."—*Whitby Gazette.*

"We cordially welcome this admirable biography of one who was as good as he was great; and it is satisfactory to think that the attractions of the work for the man of science, and its value to practical men in various departments of business, will help to introduce it in quarters where the idea too often prevails, that the Christian and the philosopher have very little in common, and that it is scarcely possible to make much of the world that now is as well as of that which is to come."—*Sunderland Herald.*

"Dr Scoresby-Jackson has done good service in presenting the world with this memorial of his departed relative. The book is well written, the illustrations are remarkably well chosen and executed, and the volume is one which all will be glad to read."—*Hull Packet.*

LANE MEDICAL LIBRARY

This book should be returned on or before
the date last stamped below.

10M-4 49—63290

[793
S42
1862

Scoresby-Jackson, Robert Edmund, 1835-1867.

Medical climatology

NAME | DATE DUE